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PROCEEDINGS
OF THE
AMERICAN SOCIETY
OF
CIVIL ENGINEERS

VOL. XLVIII—No. 9

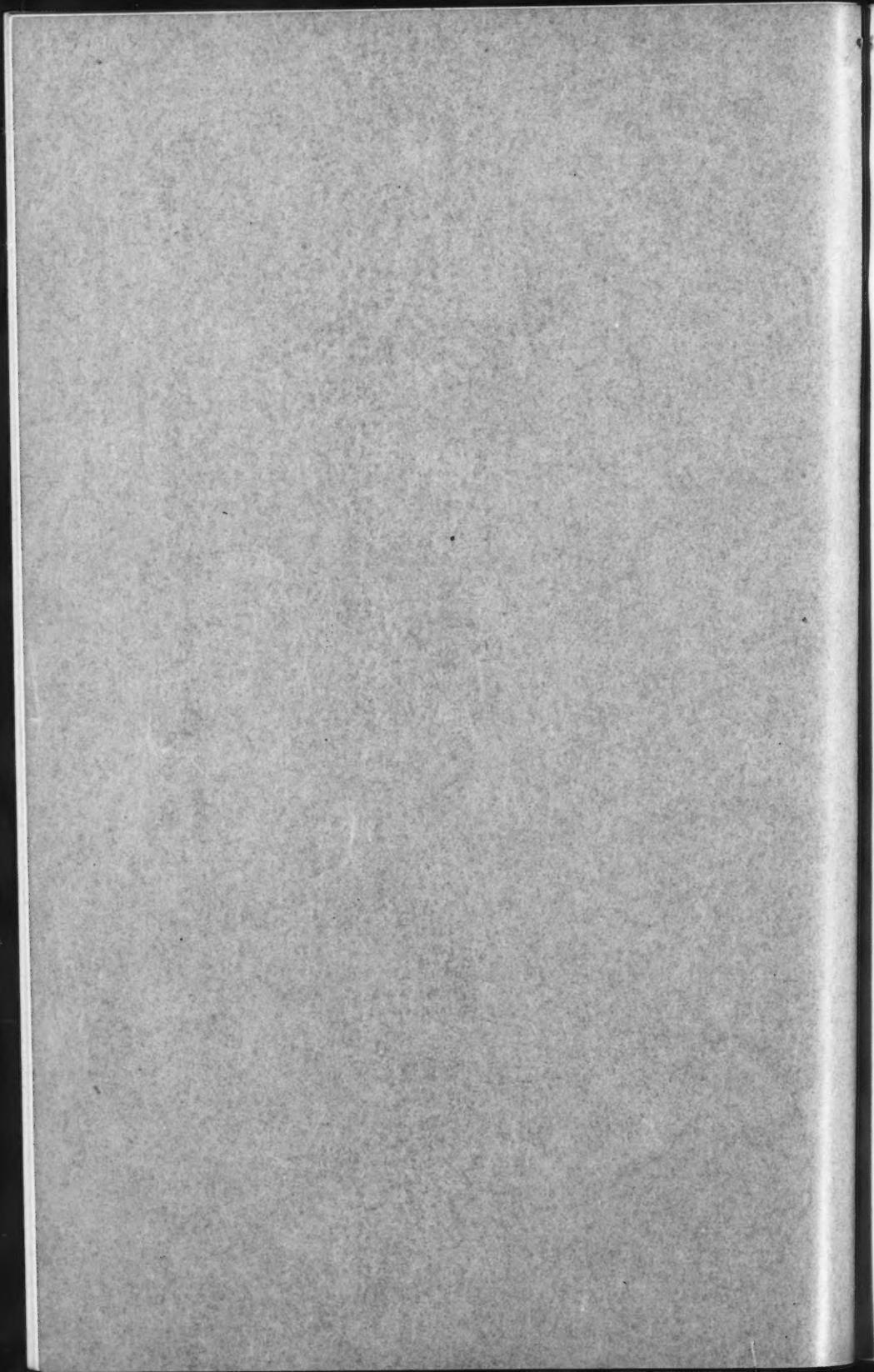


November, 1922

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PROCEEDINGS

OF THE AMERICAN SOCIETY

AMERICAN SOCIETY

CIVIL ENGINEERS

(INSTITUTED 1852)

VOL. XLVIII—No. 9.

NOVEMBER, 1922

Edited by the Secretary, under the direction of the Committee on
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American Society of Civil Engineers

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ON HIGHWAY ENGINEERING: H. Eltinge Breed, George W. Tillson, A. R. Fletcher, John M. Goodell.

ON BRIDGE DESIGN AND CONSTRUCTION: Henry B. Seaman, J. H. Ames, Victor H. Cochrane, J. E. Greiner, C. R. Harding, Otis E. Hovey, C. W. Hudson, E. F. Kelley, M. S. Ketchum, S. B. Slack, I. F. Stern, F. E. Turneaure.

ON CONTRACT STANDARD CLAUSES: H. Eltinge Breed, J. H. Brillhart, J. S. Langthorn, Edward H. Lee, Hunter McDonald, George H. Pegram, Henry H. Quimby.

ON INDUSTRIAL EDUCATION: Herman Schneider, E. J. Mehren, Leonard S. Smith.

ON RESEARCH: A. N. Talbot, F. E. Schmitt, Robert A. Cummings, W. C. Cushing, A. T. Goldbeck, D. C. Henny, R. E. Horton, Anson Marston, F. E. Turneaure.

ON ELECTRIFICATION OF STEAM RAILWAYS: Charles F. Loweth, B. J. Arnold, George Gibbs, George W. Kittredge, E. J. Pearson, Samuel Rea, Robert Ridgway.

ON STRESSES IN STRUCTURAL STEEL: F. O. Dufour, Clement E. Chase, O. F. Dalstrom, J. H. Edwards, R. J. Fogg, F. W. Masters, L. D. Rights, F. E. Schmitt, W. J. Thomas.

ON IMPACT IN HIGHWAY BRIDGES: A. H. Fuller, A. R. Eitzen, E. F. Kelley, C. T. Morris, F. E. Turneaure.

ON FLOOD-PROTECTION DATA: N. C. Grover, C. B. Burdick, W. P. Creager, H. P. Eddy, Gerard H. Matthes, Charles H. Paul, A. O. Ridgway.

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the best of hope, and the best of friends and the best of opportunities to influence and to develop the best of opportunities for the welfare of the Society and the public welfare.

AMERICAN SOCIETY OF CIVIL ENGINEERS
INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed in its publications.

SOCIETY AFFAIRS

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ITEMS OF INTEREST

The Committee on Technical Activities and Publications will be glad to receive communications of general interest to the Society, and will consider them for publication in *Proceedings* in "Items of Interest". This is intended to cover letters or suggestions from our membership concerning matters which are not of a technical character. Such communications, however, must not be controversial or commercial.

Lumber Standardization Conferences at Madison, Wis., and Chicago, Ill.

In accordance with the following resolution adopted at the General Standardization Conference, held under the auspices of the Department of Commerce, in Washington, D. C., during May, 1922,

"That the grading of all lumber be divided into three great subdivisions, namely:

"A.—Representing the best qualities.

"B.—Representing the intermediate qualities.

"C.—Representing the common qualities.

"Realizing the great field for thought in developing an equality and simplification of grades in all woods and appreciating the possibility of such accomplishment, we recommend that the National Lumber Manufacturers Association set up a competent committee with efficient engineering source seeking in so far as possible to equalize grades in all woods, and that said committee confer with representatives of the consuming public, the Departments of Commerce and Agriculture, and other agencies of the Government in their efforts as the occasion demands",

the National Lumber Manufacturers Association invited representatives of lumber manufacturers and others to meet at Madison, Wis., July 19th and 20th, 1922, to prepare and suggest a basis for the equalization and simplification of lumber grades.

Those in attendance came as individuals and not in any way representing any specific organization, nor is their action binding on any organization. The attendance was, as follows: Dudley F. Holtman, Assoc. M. Am. Soc. C. E., *Chairman*, Construction Engineer, National Lumber Manufacturers Association; C. J. Hogue, M. Am. Soc. C. E., Manager, West Coast Forest Products Bureau; J. E. Jones, Chief Inspector, Southern Pine Association; T. F. Laist, Chicago Representative, National Lumber Manufacturers Association; J. M. Pritchard, Secretary, Manager, and Chief Inspector, Hardwood Manufacturers Institute, C. H. Sherrill, President, Hardwood Manufacturers Institute; George E. Strehan, Assoc. M. Am. Soc. C. E., Consulting Engineer, Southern Pine Association; Fred W. Alexander, Secretary-Manager, Pacific Lumber Inspection Bureau; and William E. Hawley, M. Am. Soc. C. E., Assistant Engineer, Duluth, Missabe, and Northern Railway Company, Committee No. 7, American Railway Engineering Association.

Members of the Forest Products Laboratory, Forest Service, U. S. Department of Agriculture, also participated in these meetings and presented for discussion and consideration, recommendations for the grading of soft wood, yard lumber, and structural timbers, as developed from its study of this matter covering a period of years. The thought of the Laboratory was to present a basis for grading, adaptable to all soft wood species, and to be varied for various products, the idea being that through uniform grade names and definitions, a grade for any purpose in any species would be of as nearly equivalent value for its particular use as the grade of the same name in any other species.

A report, based on the rules proposed by the Laboratory, was prepared, which report was submitted to a Conference held at Chicago, Ill., July 20th-22d, 1922. At this Conference, in addition to the report of the Madison Conference, other phases of the lumber industry were discussed.

A Central Committee was appointed to prepare the information preliminary to holding the final conferences. The reports of the Madison and Chicago Conferences have been placed on file in the Reading Room of the Society, where they will be available to those interested.

Engineering Societies Library Service

The Engineering Societies Library performs an important service to the members of the Society in endeavoring not only to collect and make readily

available the useful engineering publications, but also to supply information to distant members.

In filling the requests received by mail, of which fifteen to twenty arrive each day, several experienced workers are kept busy. Most of these calls are for copies of articles in periodicals, and, if the references have been given definitely and correctly, the request is soon prepared by photo-printing. The demands for information that can be supplied by this method range from 600 to 700 photo-prints per week. Probably no invention of recent years has been of more value to investigators than the photo-print method of copying.

Translations form another important activity of the Library. The greater number asked for are from the French and German, but there are calls for translations from almost every language. The task of securing the necessary combination of linguistic and technical competence is sometimes difficult, but the Library has always succeeded in securing a translation from any language desired.

Requests are also received for various kinds of information, such as the best books on certain subjects, or a list of all writings on a certain subject, formulas, constants, specifications, etc. Some of this information can be answered, quickly from experience or by reference to the catalogue, whereas other inquiries require careful research. In case the information sought will require extended investigation, a charge is made to cover the cost of such work; there is also a charge for copying and translating. In this class of work, research is continued until the desired data are collected or the limit of cost set by the inquirer is reached.

Requests are received that are outside the province of the Library. It cannot, for example, recommend engineers for employment, nor give opinions on engineering subjects or points that are in dispute. In fact, it has no opinions, except with respect to the merits of books. All it can do when confronted with a question is to search for the written statements that deal with that question. If nothing has been written on the subject, the Library is forced to disappoint the inquirer. The officials of the Library wish to stress this point as it is the most frequent cause of dissatisfaction. Many problems arise in practice that have not been solved in books, and these, unfortunately are more than the Library can handle. Within its limits, however, the Library is constantly being helpful to many members, and suggestions of new means for extending its service are welcomed.

ACTIVITIES OF LOCAL SECTIONS*

Meetings of Duluth Section

A regular meeting of the Duluth Section was called to order at 12:15 P. M., on August 21st, 1922; President W. H. Hoyt in the chair; Walter G. Zimmermann, Secretary; and present, also 24 members and 3 guests.

After the guests had been introduced, the minutes of the meeting of July 17th, 1922, were read and approved.

The Secretary presented a letter from Secretary Dunlap stating that there had been put aside for the Section forty-four volumes of *Transactions* of the Society, which is as complete a set as is now available.

The Secretary also presented another letter from Secretary Dunlap relative to his proposed trip through the West and his intention of visiting the Section on October 16th, 1922. On motion, duly seconded, the Secretary was instructed to advise Mr. Dunlap that the members of the Section would be very glad to have him on that date which is the day of the regular October meeting, and would also invite him to be present at the meeting of the Duluth Engineers' Club in the evening.

Mr. Franklin Hutchinson, Chairman of the Library Committee, supplemented his report as presented at the meeting of July 17th, 1922, by stating that he had seen the City Librarian and that the Public Library would take care of the volumes of *Transactions*, subject to withdrawal by the members of the Section. He stated further that as the funds of the Library were low, the authorities were in no position to bind the books. After discussion of the matter, it was decided, on motion, duly seconded, to ask Secretary Dunlap to ship the books, but that the binding of them would be postponed for the present. Mr. Hutchinson also stated that the City Librarian would be glad of any assistance in selecting technical and engineering books for the Library and that if any of the members will make out lists of desirable books, he would be glad to submit such lists to the Librarian.

Mr. W. H. Woodbury called attention to the proposed visit to Duluth, the Iron Range, and the Twin Cities, of Dean Cooley and Secretary Wallace of the Federated American Engineering Societies, and on motion, duly seconded, Mr. Woodbury was appointed a committee of one to make arrangements for the proposed visit.

A paper by W. B. Patton, entitled, "Meteorological Conditions at Duluth During the Past Fifty Years," was presented by the author. In discussing the paper, Mr. J. R. Stack called attention to the recent forest fires and stated that in his opinion a survey and program for flooding the fire districts should be taken up and something constructive done in the matter. He also suggested that as this was primarily an engineer's problem the Governor might be asked to appoint an engineer on the Fire Commission. It was further suggested that Mr. Patton's paper should be circulated in connection with the problem of forest fire prevention and reforestation.

After further discussion, it was, on motion, duly seconded, decided to appoint a committee of three to get in touch with the Commission now being

* For list of Local Sections, Officers, etc., see 1922 Year Book, p. 41, and also p. 626.

appointed by the Governor and report at the next meeting. Messrs. Patton, Stack, and Shepard were subsequently appointed to act on this Committee.

MEETING OF SEPTEMBER 18TH, 1922

A regular meeting of the Duluth Section was held on September 18th, 1922; Second Vice-President O. H. Dickerson in the chair; Walter G. Zimmerman, Secretary; and present, also, 21 members and 2 guests.

The minutes of the meeting of August 21st, 1922, were read and approved.

The Secretary presented correspondence from Secretary Dunlap in further reference to his visit to the Section; a copy of President Hoyt's letter to Mr. L. W. Wallace, Executive Secretary of the Federated American Engineering Societies, in reference to Dean Cooley's proposed visit to Duluth; and President Hoyt's letter to the Committee appointed by the Section to advise and co-operate with the Governor of Minnesota in regard to the forest fire situation.

The Entertainment Committee had arranged for an automobile trip to visit the new bridges on the Congdon Boulevard, but owing to bad weather the trip was postponed. In lieu thereof, the Committee provided the following entertainment:

One of Kipling's "Departmental Ditties" entitled "Municipal" was read by Mr. J. R. Stack. An instructive talk was given by Mr. Noyes on the subject, "Development of Rock Drilling Machines", which was followed by an interesting discussion, at the conclusion of which Mr. Noyes was given a vote of thanks by those present. Mr. Stack followed with a short talk on "Demolition of the Fortress of Helgoland", as described recently by the Army officer in charge of this work.

Meeting of Kansas Section

A meeting of the Kansas Section was held on September 23d, 1922, following a banquet at Pelletier's Tea Room, Topeka, Kans., in honor of Secretary John H. Dunlap of the Society; President L. E. Conrad in the chair; F. W. Epps, Secretary; and present, also, 20 members and guests.

A very interesting address was made by Mr. Dunlap, in the course of which he explained the relation between the Parent Society and the Section, and outlined some of the things which the Section could accomplish both for the Society and for the local community.

A paper by Mr. P. H. Everhard entitled, "Engineering Developments in Western Kansas", was presented by the author.

An address on "The Relation of the Local Sections to the Federated American Engineering Societies", was made by Mr. Lloyd B. Smith, after which the meeting was thrown open for general discussion in which many of those present joined.

Meeting of the Nashville Section

A meeting of the Nashville Section was held on September 25th, 1922; President B. H. Klyce in the chair; L. C. Anderson, Secretary; and present, also, 6 members.

President Klyce addressed the meeting on "Some of the Unique Features of the Construction on the Miami, Fla., Viaduct."

Special Meeting of Northeastern Section

A special luncheon meeting was held at the call of the Chairman, on September 9th, 1922, at 1:15 p. m., at the Boston City Club; Chairman Frank B. Sanborn in the chair; Charles W. Banks, Secretary; and present, also, about 40 members and guests.

The guests of the Section included the members of the Executive Board of the Federated American Engineering Societies.

The social program which followed the luncheon consisted of several interesting addresses by the officers and members of the Executive Board. The speakers included Dean Mortimer E. Cooley, President of the Council; Vice-Presidents J. Parke Channing, W. E. Rolfe, and Dexter S. Kimball; Secretary L. W. Wallace, who called the roll of the Council, introducing each member in turn; C. F. Scott, President of the Society for the Promotion of Engineering Education, Mr. Philip N. Moore, and others.

Meeting of Philadelphia Section

A regular meeting of the Philadelphia Section was held at the Engineers' Club, on October 2d, 1922; President William Easby, Jr., in the chair; Charles H. Stevens, Secretary; and present, also, about 100 members and guests.

The meeting was preceded by an informal dinner at the Club in honor of the speaker, Dr. Delos F. Wilcox, of New York City, and other guests.

After the regular business of the meeting had been disposed of, the subject of the evening, "Capital Profit in Street Railway Investments", was presented by Dr. Wilcox, who discussed the "present-day tendency to increase the capital base for the purpose of rate-making, greatly in excess of the money invested, and pointed out the several ways in which this increase is made." Dr. Wilcox also raised the question as to whether "the financing of street railway enterprises should be on a speculative or non-speculative basis."

Discussion on the subject was participated in by Messrs. William S. Twinning, Director of the Department of City Transit; Dean William Draper Lewis, of the Law School of the University of Pennsylvania; Sheldon Potter, representative of the Board of Directors of the Philadelphia Rapid Transit Company; and C. Oscar Beasley.

Minutes of Meetings of Spokane Section

A regular meeting of the Spokane Section was held on July 14th, 1922, at the East Banquet Annex, Davenport's; Vice-President B. J. Garnett in the chair; Charles E. Davis, Secretary; and present, also, 5 members.

On motion, duly seconded, it was decided that the Section go on record as being in favor of the applications of Messrs. A. A. Young and F. G. Harvey for membership in the Society.

On motion, duly seconded, it was decided to suggest the name of Mr. J. C. Ralston as the Section member of the Sub-Committees on Power and on Harbors and Waterways.

MEETING OF AUGUST 11TH, 1922

A regular meeting of the Section was called to order on August 11th, 1922, at the East Banquet Annex, Davenport's; Vice-President B. J. Garnett in the chair; Charles E. Davis, Secretary; and present, also, 12 members.

As there was no business to be taken up, the meeting was devoted to a general discussion of the problems of the day.

MEETING OF SEPTEMBER 8TH, 1922

A regular meeting of the Section was held on September 8th, 1922, at the East Banquet Annex, Davenport's; President C. A. Burnette in the chair; Charles E. Davis, Secretary; and present, also, 11 members.

The proposed visit of Secretary John H. Dunlap of the Society was discussed, and President Burnette appointed a committee, consisting of Messrs. Butler, Tiffany, and Richardson, to arrange for Mr. Dunlap's entertainment.

On motion, duly seconded, it was unanimously decided by those present that Mr. J. D. Koren be recommended for membership in the Society.

Meeting of Utah Section

A special meeting of the Utah Section was held on September 28th, 1922, at the Weber Club, Ogden, Utah; Vice-President E. A. Porter in the chair; H. S. Kleinschmidt, Secretary; and present, also, 12 members and 2 guests.

Following a dinner which was given in honor of Secretary John H. Dunlap of the Society, at which he and Mr. H. T. Plumb, President of the Utah Engineering Council, were guests, Mr. Dunlap addressed the meeting with particular reference to the newer activities of the Parent Society in an endeavor to bring the membership closer together.

Following Mr. Dunlap's address, Vice-President Porter called on each member present to make a few remarks, in order to enlighten Mr. Dunlap as to the past history, present conditions, and future possibilities of Utah, with particular reference to the Engineering Profession.

LUNCHEON IN HONOR OF SECRETARY DUNLAP

On September 28th, 1922, a luncheon in honor of Secretary John H. Dunlap of the Society, was given at the Commercial Club, Salt Lake City, Utah, under the auspices of Engineering Council of Utah, about thirty engineers representing all branches of the Profession, being present.

ANNOUNCEMENTS

The Reading Room of the Society is open from 9 A. M. to 6 P. M., and from 7 P. M. to 10 P. M., every day, except Sundays, New Year's Day, Washington's Birthday, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day; during July and August, it is closed at 5 P. M.

FUTURE MEETINGS

November 1st, 1922.—8.00 P. M.—A regular business meeting of the Society will be held, the program for which will be announced later.

ANNUAL MEETING

The Seventieth Annual Meeting will be held at the Headquarters of the Society, 33 West 39th Street, New York City, on Wednesday and Thursday, January 17th and 18th, 1923.

SEARCHES IN THE LIBRARY

As the Library of the American Society of Civil Engineers has been merged in the Engineering Societies Library, requests for searches, copies, translations, etc., should be addressed to the Director, Engineering Societies Library, 29 West 39th Street, New York City, who will gladly give information concerning the charges for the various kinds of service. A more comprehensive statement in regard to this matter will be found on page 26 of the Year Book for 1922.

NEW LOCAL SECTIONS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

The Constitutions of the following Local Sections have been approved by the Board of Direction since the list was prepared for the 1922 Year Book, pp. 41 *et seq.*:

Dayton Section (Constitution Approved by Board, 1922).

Charles H. Paul, President; K. C. Grant, Secretary-Treasurer, Winters Bank Building, Dayton, Ohio.

Lehigh Valley Section (Constitution Approved by Board, 1922).

George H. Blakeley, President; M. O. Fuller, Secretary-Treasurer, 732 Avenue H, Bethlehem, Pa.

Sacramento Section (Constitution Approved by Board, 1922).

Albert Givan, President; Joseph W. Gross, Secretary, Forum Building, Sacramento, Calif.

Toledo Section (Constitution Approved by Board, 1922).

M. J. Riggs, President; George N. Schoonmaker, Secretary-Treasurer, 716 Stickney Avenue, Toledo, Ohio.

Virginia Section (Constitution Approved by Board, 1922).

J. C. Carpenter, President; James F. MacTier, Secretary-Treasurer, 1312 Maple Avenue, Roanoke, Va.

**NEW STUDENT CHAPTERS OF THE
AMERICAN SOCIETY OF CIVIL ENGINEERS ***

The following Student Chapters have been authorized by the Board of Direction since the list was prepared for the 1922 Year Book, pp. 46 *et seq.*:

Clemson Agricultural and Mechanical College of South Carolina.

J. H. Baumann, President; W. J. Stribling, Secretary, Clemson Agricultural and Mechanical College of South Carolina, Clemson College, S. C.

Georgia School of Technology.

F. H. Harrison, President; C. M. Kennedy, Jr., Secretary, 91 West North Avenue, Atlanta, Ga.

Lehigh University.

John N. Marshall, President; George R. Swinton, Secretary, Lehigh University, Bethlehem, Pa.

North Carolina State College of Agriculture and Engineering.

H. L. Fisher, President; A. S. Gay, Secretary, North Carolina State College, Raleigh, N. C.

Norwich University.

J. H. Kane, President; Allen J. Hamilton, Secretary, Norwich University, Northfield, Vt.

Stadia Club (University of Oklahoma).

Lester W. Ellis, President; Edward W. Mars, Secretary, University of Oklahoma, 734 DeBarr Street, Norman, Okla.

University of Virginia.

T. B. Kiener, Secretary, University of Virginia, University, Va.

Worcester Polytechnic Institute.

Carl F. Meyer, President; Albert P. Hayden, Secretary, Worcester Polytechnic Institute, Worcester, Mass.

* By a recent ruling of the Board of Direction, the minimum membership of a Student Chapter has been fixed at 12 instead of 20.

MEMBERSHIP

(From September 6th to October 3d, 1922)

ADDITIONS

HONORARY MEMBERS

		Date of Membership.
STEVENS, JOHN FRANK. Pres., Inter-Allied Technical Board, Harbin, Manchuria, China.....	{ M. Hon. M.	June 6, 1888 June 19, 1922

MEMBERS

BATES, GEORGE WHITNEY. City Engr., Lincoln, Nebr.	{ Assoc. M. M.	June 16, 1919 Aug. 28, 1922
BEEMER, JOHN ARTHUR. Chf. Engr., Walker River Irrig. Dist., Yerington, Nev.....	{ Assoc. M. M.	Sept. 12, 1916 Aug. 28, 1922
BOWMAN, CLARENCE HENRY. Dist. Engr., Wyoming State Highway Dept., Box 888, Casper, Wyo.....		Aug. 28, 1922
BROCINER, ALEXANDER. Cons. Engr., 110 West 40th St., New York City		Aug. 28, 1922
DOUGLASS, LOUIS REA. (Douglass, Corey & Fisk, Inc.), Trinidad, Colo.....	{ Assoc. M. M.	June 18, 1918 Aug. 28, 1922
FORCHHAMMER, HERLUF TROLLE. Technical Mgr., Christian & Nielsen, Victoria St., 72, London, S. W. I., England.....	{ Assoc. M. M.	Feb. 1, 1905 Aug. 28, 1922
FRANCIS, WILLIAM MORROW. Chf. Engr., Longwood, Inc., 2414 Pennsylvania Ave., Wilmington, Del.....		June 19, 1922
FULLENWIDER, CHARLES VICTOR ROCKWELL. Mgr., Elec. Expansion Joint Dept., The Philip Carey Co., Lockland, Cincinnati, (Res., 38 Burns Ave., Wyoming), Ohio.....		Aug. 28, 1922
GRIGGS, CHARLES EDWARD. City Engr., 212 East Jasper St., Tulsa, Okla.		Aug. 28, 1922
HOOPER, LEWIS GLADSTONE. Vice-Pres., L. H. Guerin Eng. Corporation, Inc., 603 Tulane-Newcomb Bldg., New Orleans, La..		Aug. 28, 1922
HULTMAN, EUGENE CHRISTIAN. Vice-Pres., Director, and Member of Executive Committee of Board of Directors, West End Street Ry., 101 Milk St., Room 810, Boston, Mass.....		Aug. 28, 1922
JAKOBSEN, BERNHARD FAABORG. Cons., Hydr. and Elec. Engr., 321 Rowell Bldg., Fresno, Calif.....	{ Assoc. M. M.	Oct. 9, 1917 Aug. 28, 1922
LYNCH, HENRY BAKER. Engr., Water System, City of Glendale, 1007 Van Nuys Bldg., Los Angeles, Calif.....		April 3, 1922
MACKEY, JOHN DERBY CORNELIUS. 231 Main St., Port Washington, N. Y.		Aug. 28, 1922
MELVILLE, JAMES HENRY STEWART. With Coverdale & Colpitts, 66 Broadway, Room 2100, New York City (Res., 331 East 7th St., Plainfield, N. J.).....		Aug. 28, 1922
MOOTS, ELMER EARL. Head of Dept., Math. and Eng., Cornell Coll., 824 Summit Ave., Mount Vernon, Iowa	{ Affiliate Assoc. M. M.	May 31, 1916 April 17, 1918 Aug. 28, 1922

MEMBERS—(Continued)

		Date of Membership.
MORE, CHARLES CHURCH. Prof. of Civ. Eng. and Head of Civ. Eng. Dept., Univ. of Washington, 4545 Fifth Ave., N. E., Seattle, Wash.....	Jun. Affiliate Assoc. M. M.	May 2, 1899 Feb. 6, 1907 Mar. 31, 1908 Aug. 28, 1922
MYERS, O'KELLY WILLIAM. Div. Engr., Wm. Barclay Parsons, 1669 Forty-fourth St., Brooklyn, N. Y.....		Aug. 28, 1922
ORBISON, ROBERT VANCE. City Mgr. and City Engr., City Hall, South Pasadena, Calif.....		Aug. 28, 1922
REX, GEORGE EVERETT. Vice-Pres., National Lumber & Creosoting Co., 314 Railway Exchange Bldg., Kansas City, Mo.....		May 8, 1922
REYNOLDS, WINCHESTER ENGLEBERT. Southern Representative, Harrington, Howard & Ash, 1012 Baltimore Ave., Kansas City, Mo.		Aug. 28, 1922
RINDSFOOS, CHARLES SIESEL. Secy-Treas., Jarrett- Chambers Co., 30 East 42d St. (Res., 126 East 19th St.), New York City.....	Jun. Assoc. M. M.	April 2, 1907 May 31, 1916 June 20, 1922
SINGER, ARTHUR GREGG. Surveyor and Regulator, Second Dist., Bureau of Surveys, 4661 Leiper St., Frankford, Philadel- phia, Pa.		Aug. 28, 1922
SMITH, HENRY ATTENBURY. Archt., 874 Broadway, New York City.		Aug. 28, 1922
SNOWDEN, RUSSELL ELSTNER. Dist. Engr., North Carolina State Highway Comm., Kinston, N. C. { M.	Assoc. M.	June 18, 1918 Aug. 28, 1922
VAN DUZER, WILLIAM ALBIE. Asst. Maintenance Engr., Pennsylvania State Highway Dept. (Res., 618 North 2d St.), Harrisburg, Pa.....	Assoc. M. M.	June 30, 1911 April 4, 1922
WILSON, WILBUR M. Research Prof., Structural Eng., Univ. of Illinois, 218 Engineering Hall, Urbana, Ill.....		Aug. 28, 1922

ASSOCIATE MEMBERS

ALLEN, JOHN MICHAEL. Engr. and Gen. Supt., Clinchfield Carbocoal Corporation of South Clinchfield, Va., 135 Washington Ave., Newark, N. J.....		Aug. 28, 1922
AUSTIN, FRED HARRISON. Engr. in chg. of office, Currie Eng. Co., 1041 Second St., Webster City, Iowa.....		June 19, 1922
BARBER, RAY PARKER. Asst. Chf. Engr., The A. Bentley & Sons Co. (Res., 2559 Maplewood Ave.), Toledo, Ohio.....		Aug. 28, 1922
BETTS, CLIFFORD ALLEN. Res. Engr., Blue River Project, Denver Municipal Water-Works, 1654 Broadway, Denver, Colo.....		May 8, 1922
BLAIN, CLAUD FRANCIS. Locating Engr., Public Works Dept., Syd- ney, New South Wales, Australia.....		April 3, 1922
BLANEY, HARRY FRENCH. Irrig. Engr., U. S. Dept. of Agriculture, Bureau of Public Roads, 601 Federal Bldg., Los Angeles, Calif.		Aug. 28, 1922
BOYCE, EARNEST. Asst. Engr., Kansas State Board of Health; Asst. Prof. of San. Eng., Kansas State Univ., 1703 Independ- ent St., Lawrence, Kans.....		April 3, 1922
BRAND, HARRISON, JR. 2360 Massachusetts Ave., Washington, D. C.		Aug. 28, 1922
BROCKWAY, WARNER COTTON. Asst. Engr., Bureau of Eng., Michigan Dept. of Health, Lansing, Mich. { Assoc. M.	Jun.	April 14, 1919 Aug. 28, 1922
CLELAND, JOHN WILLIAMS. Asst. Chf. Engr., Southern California Gas Co., 1904 Gardena Ave., Glendale, Calif.....		Aug. 28, 1922

ASSOCIATE MEMBERS—(Continued)		Date of Membership.
CROWLEY, WILLIAM THOMAS. City Engr., City Engr.'s Office, Lock Haven, Pa.	Jun. { Assoc. M.	Jan. 19, 1920 Aug. 28, 1922
CUNNINGHAM, SEABORN JONES. Asst. Engr., Public Service Comm., 119 North Kensington, Kansas City, Mo.		Aug. 28, 1922
ENGLANDER, HARRY. 3801 Review Pl., New York City.		Aug. 28, 1922
FRECH, HARRY EDWARD. Dist. Engr., Portland Cement Assoc., 1313 Syndicate Trust Bldg., St. Louis, Mo.		Aug. 28, 1922
GLEIM, CHARLES SAILOR. Res. Engr., New York and New Jersey Bridge and Tunnel Commissions, Hall of Records, New York City (Res., 411 Prospect St., Westfield, N. J.)		Aug. 28, 1922
GROSS, DEWITT CLINTON. Structural Engr. and Designer, 5334 Hutchinson Ave., Chicago, Ill.	Jun. { Assoc. M.	Nov. 9, 1920 Aug. 28, 1922
HEUPERMANN, LAMBERTUS FREDERIK. Res. Engr., Oregon State Highway Comm., Box 504, Salem, Ore.		Aug. 28, 1922
HILL, GEORGE EARL. Porterfield, Wis.		April 3, 1922
HOGENTOGLER, CHESTER ALLEN. Highway Engr., Div. of Tests and Research, U. S. Bureau of Public Roads, 1819 M St., N. W., Washington, D. C.		Aug. 28, 1922
KELIHER, LESTER JOSEF NEWMAN. Mgr., Keliher Constr. Co., 308 Southern Trust Bldg., Little Rock, Ark.		Aug. 28, 1922
KERR, CHARLES MACDONALD. Engr., The Creosoted Materials Co., Inc., 301 Queen and Crescent Bldg., New Orleans, La.		Aug. 28, 1922
LAYMAN, HAROLD LFSLIE. Instr., Civ. Eng., Univ. of Kansas, 1420 Ohio St., Lawrence, Kans.		Aug. 28, 1922
LOCHBRIDGE, JAMES LEWIS. Office Engr., Wichita County Water Impvt., 1004 Am. National Bank Bldg., Wichita Falls, Tex.		Aug. 28, 1922
MACBEATH, DAVID LIVINGSTONE. Supt. of Constr., U. S. Bureau of Public Roads, 881 Mills Bldg., San Francisco, Calif.		Aug. 28, 1922
MCINTYRE, CLIFFORD THOMAS. Asst. Engr., City of Highland Park, 218 Colorado Ave., Highland Park, Mich.		Aug. 28, 1922
MCKENZIE, JAMES GORDON. Insp., U. S. Engr. Office, Galveston, Tex.		Aug. 28, 1922
PAHL, WILLIAM HENRY. Instr., Civ. Eng. Dept., Univ. of Nebraska, Lincoln, Nebr.		Aug. 28, 1922
PEARSON, RODERIC. Highway Bridge Engr., U. S. Bureau of Public Roads, Ogden, Utah.		Aug. 28, 1922
POLLOCK, JAMES RANDAL. San. Engr., City Eng. Dept., City Engr.'s Office, Lansing, Mich.		May 8, 1922
RESMAW, CHARLES WALLACE. With Edgar T. Wheeler Co., 402 Los Angeles Ry. Bldg. (Res., 4022 Walton Ave.), Los Angeles, Calif.		Aug. 28, 1922
RHYNUS, CLARENCE PAULDING. With W. J. Sherman Co., 302 Produce Exchange Bldg., Toledo, Ohio.	Jun. { Assoc. M.	April 7, 1915 Aug. 28, 1922
RICE, EUGENE FRANKLIN. Asst. Engr., Central Aguirre Sugar Co., Central Aguirre, Porto Rico.		Aug. 28, 1922
RIESBOL, HENRY CLAY. 315 West 136th St., New York City.		Aug. 28, 1922
STEVENS, HERBERT CHESTER. Supt. in Chg., Pulp Mill, Panstock Corporation, Caledonia, Nova Scotia, Canada.		Aug. 28, 1922
STRAND, GUSTAVE ADOLPH. Dist. Sales Mgr., Trojan Powder Co., San Francisco (Res., 5438 Claremont Ave., Oakland), Calif.		Aug. 28, 1922

ASSOCIATE MEMBERS—(Continued)

Date of
Membership.

STROUT, PHILIP STANWOOD. Asst. to Vice-Pres., Wm. Filenes Sons Co., 42 East Elm Ave., Wollaston, Mass.....	May 8, 1922
WALKWITZ, CLARENCE ARTHUR. 4818 Sheridan Rd., Chicago, Ill..	Aug. 28, 1922
WEBSTER, WADE LOWE. Res. Engr., Tennessee Highway Dept., Box 27, Rogersville, Tenn.....	Aug. 28, 1922

AFFILIATES

WARE, RALPH FRANKLIN. 2146 East 38th St., Los Angeles, Calif... .	Aug. 28, 1922
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JUNIORS

BISSCHOP, PHILIP ROWLAND ROOSEGAARDE. Care, Madera Irrig. Dist., Madera, Calif.....	Aug. 28, 1922
BRYAN, RICHARD PEARSON. Res. Engr., State of Nevada Dept. of Highways, Kimberly, Nev.....	Aug. 28, 1922
BUTLER, HERBERT FULLER. 20 Earle Pl., New Rochelle, N. Y....	Aug. 28, 1922
BUTLER, JOE BEATY. Asst. Prof., Civ. Eng., Missouri School of Mines, Box 547, Rolla, Mo.....	Aug. 28, 1922
CASCIO, SALVATORE. 2016 Seventy-seventh St., Brooklyn, N. Y....	Aug. 28, 1922
CASEY, JOHN FRANCIS, JR. Asst. to Chf. Engr., John F. Casey Co., 935 Union Arcade Bldg., Pittsburgh, Pa.....	Aug. 28, 1922
CRAIGHEAD, PHILIP BROOKS. 315 Amber St., Pittsburgh, Pa.....	Aug. 28, 1922
GOERGER, GUSTAV ARTHUR. Care, Lampman, 470 Driving Park Ave., Rochester, N. Y.....	Aug. 28, 1922
KHAN, ABOL FAZL. 2864 West St., Ames, Iowa.....	Aug. 28, 1922
LIU, YI. Second and Liu Sts., Tientsin, China.....	June 19, 1922
MERIWETHER, CHARLES ALBERT. Rodman, Dept. of Public Works, Bureau of Eng., 227 Warrick Lane, Lynchburg, Va.....	May 8, 1922
SLOVENKO, JULIUS. Puerto Cortez, Honduras.....	June 19, 1922
SMITH, HARRY. Care, The H. D. Watts Co., 435 Law Bldg., Norfolk, Va.	Aug. 28, 1922
SPECHT, CASPER LAWRENCE. Civ. Engr., 616 East 4th St., Brooklyn, N. Y.	May 8, 1922
STUDDS, ROBERT FRANCIS ANTHONY. With U. S. Coast and Geodetic Survey, Box 2512, San Francisco, Calif.....	Aug. 28, 1922

REINSTATEMENTS

JUNIORS

Date of
Reinstatement.

CHRISTIAN, VALENTINE.....	September 6, 1922
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RESIGNATIONS

JUNIORS

Date of
Resignation.

JAENICKE, WILLIAM HUGO.....	September 6, 1922
MIAO, EN-CHAO.....	September 6, 1922

DEATHS

- BRYSON, THOMAS BINES. Elected Associate Member, February 7th, 1900; died September 5th, 1922.
- HIRSCH, HERMAN DAVID. Elected Associate Member, June 18th, 1918; died in August, 1922.

Total Membership of the Society, October 3d, 1922

Members	4 622
Associate Members.....	5 235
Corporate Members	9 857
Honorary Members.....	11
Juniors	461
Affiliates	170
Fellows	10
Total	10 509

STATEMENT OF MEMBERSHIP

In view of the fact that the Society has been unable to secure a definite statement of the number of members in each State, it is requested that the Secretary receive from each State a report of the number of members in that State.

MEMBERSHIP

To date
members
have
been
admitted

REGULAR

REPORT OF MEMBERSHIP
TO DATE

ENGINEERING SOCIETIES EMPLOYMENT SERVICE

An Engineering Societies Service Bureau was established December 1st, 1918, as an activity of Engineering Council. It was managed by a board made up of the Secretaries of the four Founder Societies, and funds for its maintenance were provided by these Societies. On January 1st, 1921, this Bureau was taken over by The Federated American Engineering Societies and was known as the Employment Service of that organization. Recently, the management of the Service has been taken over by the Founder Societies. A weekly Employment Bulletin, listing the positions available, may be seen at the office of any Secretary of a Local Section. Members of the American Society of Civil Engineers who desire to register should apply for further information, registration forms, etc., to Walter V. Brown, Manager, Engineering Societies Building, 29 West 39th Street, New York City. In order to be included in the list published in *Proceedings*, copy must be received on or before the first of each month. All communications should be addressed to Mr. Brown.

EMPLOYMENT BULLETIN

POSITIONS AVAILABLE

CHEMICAL ENGINEER who has had actual experience in putting up naphthalene plants. Application by letter. Salary not stated. Location, New York City. V-1627.

editorial and plant management experience. Salary not stated. Location, New York City. V-2117.

STRUCTURAL STEEL DETAILER experienced in shop detailing. Application in person. Location, New York City. V-2000.

CIVIL ENGINEER experienced on road construction, setting grades, etc. Application by letter. Location, New York City. V-2144.

EXPERIENCED CHECKERS (2) on structural steel work. Must have had experience on buildings. Application in person. Location, New York City. V-2020.

STRUCTURAL STEEL DRAFTSMAN (1 or 2) on design and checking in connection with architectural plans. Must be experienced. 6 to 8 weeks' work. Application in person. Location, New York City. V-2163.

ARCHITECTURAL DRAFTSMAN experienced on schoolhouses. Application in person. Location, New York City. V-2047.

FOREMAN in dry press shop. At present, department employs from 40 to 50 persons. Must have had experience in dry-pressing of porcelain. Position eventually leads to superintendency of plant. Age 30 to 35; technical education not essential, but experience is necessary. Application by letter. Salary depends on experience of applicant. Location, Ill. V-2179.

STRUCTURAL STEEL DETAILERS AND CHECKERS (5). Must be experienced men. Application in person. Location, New York City. V-2054.

CIVIL ENGINEERS (3) experienced on highway construction to act as sales promotion experts among State commissioners, engineers, and contractors. Application by letter. Salary not stated. Location, Ohio. V-2180.

CONCRETE DRAFTSMAN on industrial building work. Must be capable of laying out concrete work. Application in person. Location, New York City. V-2073.

HIGH-GRADE DESIGNER experienced along the lines of adding and calculating machines, typewriters, type-setting machines, or similar apparatus. Application in person. Salary not stated. Location, New Jersey. V-2186.

HIGH-GRADE SALES EXECUTIVE with broad knowledge of industrial field to carry on an educational industrial campaign among manufacturers; complete details required. Application by letter. Headquarters, New York City. V-2097.

CONSTRUCTION SUPERINTENDENT on reinforced concrete manufacturing building or wood frame office buildings. Three or four years' experience on construction work in charge of men. Application by letter. Salary not stated. Location, Penna. V-2187.

SALES ENGINEERS, three of whom are to possess the qualifications requisite to apply gas-fired steam boilers in industries and also for house heating; one for application of gas-fired appliances for heat treatment of metals; and one to possess qualifications for application of gas to gas-burning equipment to large bake ovens. Application by letter. Location, New York City. V-2116.

ASSOCIATE EDITOR with plant engineering experience. Application by letter, stating age, education, and experience. Must have

ARCHITECTURAL DRAFTSMAN for residential and alteration work. Man familiar with New York building rules and having 2 to 3 years' experience. Application in person. Location, New York. V-2190.

SALESMAN with knowledge of coal combustion for heating and power plant, to sell fuel economy apparatus, designed to burn buckwheat coal and screenings in plants where larger and more expensive coal is used. Application in person. Commission basis. Location, Philadelphia, Pa. V-2191.

APPRENTICE AND ASSISTANT TEST ENGINEERS, mechanical engineering graduates, for testing turbines, pumps, condensers. Central station plants. Application by letter. Location, Penna. V-2196.

FOREMAN of die and machine shop with knowledge of special porcelain dies. Shop employs 12 men. Application by letter. Location, Illinois. V-2204.

TIME STUDY ENGINEER with about five years' experience. Duties will be on loading and other labor problems. Application by letter, stating age, experience, etc. Salary not stated. Location, New York City. V-2214.

COAL, OIL AND NATURAL GAS ENGINEERS for report and research work in Government departments. Application by letter. Salary depends on experience. Location, Washington, D. C. V-2215.

STRUCTURAL DRAFTSMAN, two years' experience. Temporary until Civil Service examination is taken, and if passed, position will be permanent. Application in person. Location, New York City. V-2236.

EXPERIENCED ESTIMATOR, thoroughly posted on reinforced concrete and general building work. Only those having had at least two years' experience with one of the large construction companies will be considered. Application by letter only. Location, New York City. V-2258.

DRAFTSMAN for building construction on schools and churches. Application by letter, stating age, education and experience. Only engineers with this experience considered. Location, Penna. V-2266.

DESIGNER on structural steel and reinforced concrete buildings, bridges, etc. Temporary position, 6 months. Application by letter, giving age, education, and experience. Salary not stated. Location, Cuba. V-2269.

ARTISTS to handle sale and installation of Newport Rotary Oil Burner, an oil burner burning efficiently 11° Baumé Mexican oil for high and low-pressure steam and hot-water boilers. Exclusive territory granted. Application by letter. Salary not stated. Headquarters, Rhode Island. V-2274.

ENGINEER to organize and take charge of district promotional and educational work on use of lime in building, agriculture, and chemistry. Work will be field work. Must have business experience in organization, sales and executive capacities, initiative, adaptability, common sense, perseverance, good address, and ability to co-operate.

Application by letter. District headquarters, St. Louis, Mo. National headquarters, Washington, D. C. V-2278.

YOUNG ENGINEER, Electrical or mechanical, experienced in the use and application of auxiliary for high-pressure, modern, steam power plants. Ability to write advertising copy and prepare technical articles for press essential. Company manufactures electrical valve-control equipment used exclusively on steam lines in large power stations and also complete line of valve-control apparatus for water-works and power stations. Will also act as research engineer for new fields for control and must possess sufficient business and engineering knowledge to carry on work without supervision. Prefer married man, age not over 35 or 40, already in a similar position. Application by letter. Salary not stated. Location, Conn. V-2302.

ENGINEER capable of doing some editorial work for *Marine Review*. Some practical experience at sea, in shipyards, or preferably in office of well organized ship-operating company desirable. Should have had at least five years' practical experience. Experience as technical journalist desirable, but not necessary. Ability to write absolutely essential. Must be familiar with American shipping. Application by letter. Location, Ohio. V-2308.

SALESMEN capable of rapid development into Branch Managers, some traveling necessary, but only on short trips in nearby territory. Automobile experience preferred. Application by letter. Salary and commission basis. Location, Ohio. V-2313.

DESIGNER, experienced on centrifugal pumps or velocity machines and reciprocating pumps, engine work, or allied lines. Application by letter, stating education, experience, age, physical characteristics, compensation required, and when available, in handwriting. Salary not stated. Location, Mass. V-2328.

DRAFTSMEN experienced in building design. Must be able to handle both concrete and steel for large automobile plant. Application by letter, stating age, salary, and date available. Salary not stated. Location, Michigan. V-2330.

DRAFTSMEN with some knowledge of pipe layouts. Application by letter. Salary not stated. Location, Penna. V-2343.

STEEL AND REINFORCED CONCRETE DRAFTSMAN experienced on flat slab work. Application in person. Location, New York City. V-2349.

ESTIMATOR to take off reinforced steel, metal lathe, steel tile, steel lumber. Experienced man only. Application in person. Location, New York City. V-2352.

SALES REPRESENTATIVES for new concern manufacturing steam turbines. Preference given to men having one of the following qualifications: (1) Graduate mechanical or electrical engineer; (2) Experienced in steam turbine design, manufacture or sales; and (3) Established as representative at present of some other concern selling pumps or power-plant contractor. Application by letter, giving qualifications and references. Commission

basis. Location, Philadelphia, Pittsburgh, Cleveland, Chicago, New Orleans, Kansas City, and St. Louis territories. Headquarters, New York State. V-2358.

TOPOGRAPHICAL DRAFTSMAN. Work will consist of taking field notes, making necessary calculations, plotting, and tracing. Transportation paid from port of sailing. Board about \$30 per month. Should be single, or, if married, be willing to go without family. Application by letter. Location, Guatemala. V-2359.

ARCHITECTURAL DRAFTSMAN with experience on factory construction. Application in person. Salary not stated. Location, Northern New Jersey. V-2367.

ENGINEER to represent company in making contracts with industrial concerns for installation of a training program for foremen. Must have selling experience. Part-time basis considered. Application by letter. Commission basis. Location, New York City. V-2379.

ERCTION ENGINEER experienced on general machine erection to handle installation of industrial ovens. Application in person. Location, Traveling. V-2387.

ARCHITECTURAL DRAFTSMAN, A-1, who must be an excellent letterer. American citizen and citizen of New York State. 3 to 4 weeks' work. Application in person. Location, New York. V-2388.

SALES ENGINEERS (2) to sell lubricating oils, cutting oils, and like products to industrial plants. Prefer man with from one to two years' experience on specialties sold to engine room. Should be sufficiently familiar with machinery and plant conditions to influence oil specifications at this source. Application in person. Expenses paid, with commission arrangement based on salesman's net profits. Location, New York District. V-2404.

SAFETY ENGINEER. Application by letter. Location, New York State. V-2408.

DESIGNER for textile dryers. Engineer must have this experience. Application by letter, stating age, education, and experience. Application by letter. Salary not stated. Location, New England. V-2409.

ASSISTANT SUPERINTENDENT, young man between ages of 25 and 30. Must be able to handle tools necessary to make minor repairs on machinery, piping, conveyors, etc., keep records of material and production, and in general fit himself to take over position of superintendent when vacancy occurs. Application by letter only, giving full details as to experience and qualifications. Salary small until ability is demonstrated. Location, New Jersey. V-2427.

CHIEF DRAFTSMAN to take charge of details. General structural steel experience and also some house experience. Application in person. Location, New York. V-2434.

COMBUSTION ENGINEER AND SALES, mostly sales. Acquaintance with New York City and State of New Jersey. 30 to 37 years old. Application by letter. Salary depends on man. Location, New York City. V-2437.

CIVIL ENGINEERS (3) for work in Santo Domingo, consisting mostly of field work. Should be capable of taking charge of a party under general direction of an engineer now on work; another to be an assistant to bring up levels in contour work, etc. Salaries will depend on experience, etc. Application in person. Salary not stated. Transportation is furnished; also board and lodging while men are working in field. V-2443.

YOUNG CIVIL ENGINEER eventually to become head of Civil Engineering Department. Must have ability to direct work of field parties engaged on surveys for hydro-electric projects and transmission lines, and also sufficient knowledge of general building and other construction to design and carry on necessary general maintenance, other than electrical, of properties of various companies consisting of hydro-electric generating stations, substations, gas works, water-works, and street railway. Application by letter. Location, New York State. V-2453.

CONSTRUCTION ENGINEER specializing in line of oil mills for extracting oil from olive husks by means of carbon sulphide (or any other solvent that gives better results than sulphide), including installation of soap plant, complete refinery (neutralization, deodorization, and decoloring). Application by letter. Salary not stated. Location, Mahdia, Tunis. V-2458.

ESTIMATOR AND DESIGNER on reinforced concrete structures, docks, and piers. Should be technical graduate, between ages of 25 and 30. Application by letter. Salary not stated. Location, New York City. V-2459.

INSPECTOR for excavation work. Recent graduate. Application in person. Temporary position, possibly working into permanent one. Location, New York City. V-2460.

SUPERINTENDENT for office building. Experienced man about 35 to 40 years old. Application in person. Location, New York City. V-2461.

ENGINEERS (6) with sales experience to handle new style grate for burning barley coal. Application in person. Commission basis. Location, New York City. V-2491.

RECENT GRADUATES. One with two years' experience, holding either chemical, mechanical, electrical, or civil degrees. Would enter refinery practically as students for general refinery work which would permit a close observation of qualifications and aptitude so that later might be placed where there would be real chance for service. Application by letter. Location, New Jersey. V-2497.

YOUNG MECHANICAL ENGINEER with training in economics as well as engineering. Practical experience in factory production and management essential, also sympathetic understanding of American labor movement. Desired for research and preparation of briefs, reports, exhibits, etc., chiefly in field of industrial relations. Application by letter, submitting complete statement of qualifications. Salary not stated. Location, New York City. V-2498.

ENGINEER experienced in reinforced concrete design applying to heavy work required in foundations for deep condenser pits, and work of that nature. Application by letter. Salary not stated. Location, New York City. V-2499.

DESIGNERS on structural steel for buildings. Experience on shop details. Application by letter. Salary not stated. Location, New York City. V-2502.

SALES ENGINEER, to sell industrial paint of unique qualities. Possibility of handling other interesting lines. Sales experience not necessary. Good proposition for recent graduate wishing to enter sales game. Application in person by appointment. Commission basis. Headquarters, New York City. V-2504.

SALES REPRESENTATIVES to represent gas and oil-burning equipment company in United States. Application by letter. Salary not stated. V-2513.

SALES ENGINEER, young, single man having one or two years' practical experience for exploiting sale of a line of industrial equipment in New England and Middle Atlantic States. Application by letter, stating age, experience, and salary expected. Headquarters, New York City. V-2517.

SALES ENGINEER to sell crushing and grinding machinery. Application in person. Commission basis. Location, New York City. V-2522.

TOPOGRAPHICAL DRAFTSMEN, experienced in topography and map drafting. Must be good letterers. Railroad work. Application by letter. All expenses. Location, Tenn. V-2533.

CONCRETE INSPECTORS (3), must have at least four years on heavy concrete work. Single men. Application in person. Transportation. Location, Alabama. V-2542.

LABORATORY MAN, experienced in testing concrete briquettes. Application in person, New York City. Transportation paid. Location, Alabama. V-2543.

ARCHITECTURAL DRAFTSMAN able to make working drawings from sketches, any details necessary filing in city departments, etc. Application in person. Location, New York City. V-2546.

ENGINEER with advertising or catalogue writing experience. Application by letter, stating age, education, and experience in detail. Salary not stated. Location, New York State. V-2548.

ENGINEER familiar with light structural steel erection within a plant, also structural steel assembling for small machinery, such as blowers and heating units. Resident of Elizabeth, N. J. preferred. Temporary. Application in person. Salary not stated. Location, New Jersey. V-2551.

DRAFTSMAN with structural steel experience. Application in person. Location, New York City. V-2563.

DRAFTSMAN with timber experience. Application in person. Location, New York City. V-2568.

ARCHITECTURAL MEN to take off quantities and build up materials for railroad buildings, then to apply prices to the built-up materials. Application in person. Location, New York City. V-2567.

CHIEF DRAFTSMAN experienced on reinforced concrete factory buildings. Need not necessarily be a designer, but must be able to run office. Application in person. Location, New Jersey. V-2570.

COST CLERK competent to keep track of cost of production of sugar in raw sugar factory that has in conjunction with it a refinery and distillery. Living quarters provided if married, and room if single. Would have to purchase food, or board. Best of food or board would be somewhat less than if purchased in New York City. Will be sent to plant sometime in November. Application by letter. Headquarters, New York City. Location, Philippine Islands. V-2573.

ARCHITECTURAL DRAFTSMAN with good academic training. No previous practical experience necessary. Application in person. Location, New York City. V-2575.

ENGINEER experienced in the design, operation, and sale of insulating materials in connection with installations of all forms of drying apparatus, such as textile dryers, tentering frames, leather dryer, dryers used in chemical processes, and will also enter field of japanning ovens, as used in automobile and metal industry. Must have had thorough sales experience in addition to the necessary technical training. Application by letter stating age, education, and experience in detail. Salary not stated. Location, Penna. V-2576.

MAINTENANCE ENGINEER with millwright experience. Application by letter. Location, New York City and vicinity. V-2577.

ENGINEERS AND DRAFTSMEN for central office, engineering division, for men with college training in engineering or the physical sciences. Practical telephone experience may substitute. Draftsmen who have had technical high school training and from 2 to 4 years' drafting experience. Application by letter. Salary not stated. Location, Illinois. V-2578.

DRAFTSMAN for sugar mill. Prefer young man recently graduated from college or architectural or engineering school, who could be classed as good draftsman. Working knowledge of Spanish desirable. Application by letter. Board and lodging furnished on estate by employer; transportation from New York to plantation given. Headquarters, New York City. Location, Cuba. V-2580.

STRUCTURAL ENGINEER thoroughly trained in design of structural steel and reinforced concrete for buildings. One who can write specifications and attend to supervision preferred. Application by letter. Salary not stated. Location, Arkansas. V-2581.

ENGINEER experienced in road building and handling of crushed stone, to call on firms to investigate the market in Illinois with view of opening a lime quarry. Application by letter. Salary not stated. Location, Illinois. V-2611.

DRAFTSMAN familiar with power plant, water supply, and architectural work. Must speak Spanish. Salary not stated. Application by letter. Location, South America. V-2618.

ARCHITECT experienced in general design, office, industrial, and municipal buildings. Must speak Spanish. Application by letter. Salary not stated. Location, South America. V-2619.

CHIEF DRAFTSMAN to take charge of drafting office. Must speak Spanish. Application by letter. Salary not stated. Location, South America. V-2621.

COST ENGINEER experienced in general contracting cost work; also cost plus basis system for municipal work. Must be able to establish cost system for contractor's office. Spanish desirable. Application by letter. Salary not stated. Location, South America. V-2622.

MEN AVAILABLE

STRUCTURAL ENGINEER, Assoc. M. Am. Soc. C. E.; age 38; married. Fourteen years in miscellaneous engineering, including large steel plant construction, ice plants, industrial plants, capable of taking responsible charge of purchase and arrangements of equipment, structural design, power requirements, specifications, and contracts. CE-360.

EXECUTIVE ENGINEER, with sales, advertising, and marketing experience. Technical work required knowledge of structural, highway, steam and electric railway engineering; valuation, correspondence, reports, economics, general business and industry, and physical metallurgy. Good address; age 38. Professional practice and Chicago location preferred. CE-361.

CIVIL ENGINEER is open for responsible executive position; college graduate. Twenty years' practical experience in design and construction work of all kinds; thoroughly conversant with appraisal work, the preparation of reports and financial statements, and the analysis of general business conditions, in regard to engineering projects. Highest technical and business references. CE-362.

CIVIL ENGINEER, Univ. of Pennsylvania; age 30. Eight years' experience including railroad construction, design, and maintenance, steel mill layout and construction, triangulation and topography, roads, bridges, and wharves. Permanently located at present, but desires change to something leading up to an executive position.

Location immaterial. Speaks French and little Spanish. CE-363.

OFFICE AND FIELD ENGINEER; technical graduate; age 33; married. Nine years' experience along administrative and executive lines, covering field superintendence, special investigations, and reports, employment and statistical work; desires position in construction, industrial, or manufacturing fields. CE-364.

GRADUATE CIVIL ENGINEER AND CONSTRUCTION SUPERINTENDENT; Assoc. M. Am. Soc. C. E.; age 34; degree 1908. Twelve years' experience, roads, bridges, surveys, sewers, water-works, and concrete industrial buildings. Experience includes design, inspection, and superintendence. Two years in charge of war work for Construction Division, U. S. A. Available at once. Location immaterial. CE-365.

CONSTRUCTION ENGINEER, Cornell graduate, with street railway, power plant, hydro-electric, and industrial building experience; also, power-plant design. CE-366.

CIVIL ENGINEER, M. Am. Soc. C. E., and other organizations, desires working partnership or permanent employment; high-grade technical and academic education; complete office and field equipment; 25 years' successful practice, water supply, sewerage, garbage disposal, pavements, steam and hydro-electric plants, and other construction; city engineer for several hundred thousand population; active; good health; personal interview New York City or vicinity. CE-367.

MINUTES OF MEETINGS OF THE SOCIETY

October 4th, 1922.—The meeting was called to order at 8:10 p. m.; J. Waldo Smith, M. Am. Soc. C. E., in the chair; C. E. Beam, acting as Secretary; and present, also, 134 members and guests.

The minutes of the meeting of September 6th, 1922, were approved as printed in *Proceedings* for October, 1922.

The following deaths were announced:

THOMAS BINES BRYSON, of New York City, elected Associate Member, February 7th, 1900; died September 5th, 1922.

HERMAN DAVID HIRSCH, of Cape Town, South Africa, elected Associate Member, June 18th, 1918; died in August, 1922.

A paper entitled "Experiments with Models of the Gilboa Dam and Spillway", by R. W. Gausmann and C. M. Madden, Associate Members, Am. Soc. C. E., was presented by Mr. Gausmann, who illustrated his remarks with lantern slides.

A paper by Charles P. Berkey, Esq., and James F. Sanborn, M. Am. Soc. C. E., entitled "Engineering Geology of the Catskill Water Supply" was presented by Mr. Sanborn, who also illustrated his remarks with lantern slides.

The meeting was then opened to discussion which was participated in by Messrs. Lazarus White, William W. Brush, Walter E. Spear, Arthur S. Tuttle, Thomas H. Wiggin, who illustrated his discussion with lantern slides, Louis L. Tribus, E. G. Haines, X. Henry Goodnough, and J. Waldo Smith. Written discussion on the paper by Messrs. Berkey and Sanborn, by Alfred D. Flinn, M. Am. Soc. C. E., was announced.

Adjourned.

NEW BOOKS*

(From September 1st to September 30th, 1922)

**The statements made in these notices are taken from the books themselves,
and this Society is not responsible for them.**

DONATIONS TO ENGINEERING SOCIETIES LIBRARY

PROPERTIES OF ELECTRICALLY CONDUCTING SYSTEMS.

By Charles A. Kraus. (American Chemical Society. Monograph Series.) N. Y., Chemical Catalog Co., 1922. 415 pp., diagrams, 9 x 6 in., cloth, \$4.50.

The author here presents a comprehensive, systematic account of the more important conclusions reached by the study of ionic phenomena, which have hitherto been available only in scattered form, in periodicals and transactions of scientific societies. His book affords a convenient summary of the contemporary understanding of the subject, useful both to those directly engaged in studying it and to investigators in allied sciences.

ELEMENTARY DETERMINANTS FOR ELECTRICAL ENGINEERS.

By Herbert P. Few. Lond., S. Rentell & Co., Ltd.; N. Y., D. Van Nostrand Co., 1922. 98 pp., 7 x 5 in., cloth. \$1.50.

This material appeared originally as articles in *Electricity*, the aim of the author being to emphasize the advantages that the methods of determinants possess over ordinary algebraic processes for solving many types of problems of interest to electrical engineers. Examples are given dealing with testing, telephony, telegraphy, power distribution, cable balancing, etc.

DICTIONARY OF APPLIED PHYSICS.

Edited by Sir Richard Glazebrook. Vol. 2, Electricity. Lond., Macmillan and Co., Ltd., 1922. 1 104 pp., illus., 9 x 6 in., cloth. \$15.00.

The second volume of this important reference work contains many articles of importance to electrical engineers and physicists. Some of the longer articles are: Photoelectricity, by H. Stanley Allen; Technical Applications of Electrolysis, by A. J. Allmand; Arc Lamps, by R. E. Angold; Positive Rays, by F. W. Aston; Insulated Electric Cables, by C. J. Beaver; Switchgear, by R. A. R. Bolton; Capacity and Inductance, by Albert Campbell; Batteries, by W. R. Cooper; Electrons, by J. A. Crowther; Magnetic and Radio-Frequency Measurements, by D. W. Dye; Molecular Theories of Magnetism, by Kotaro Honda; Telephony, by F. B. Jewett; Magnet Design, by R. L. Jones; Stray-Current Electrolysis, by Burton McCollum; Thermionics, by O. W. Richardson and W. Wilson. Numerous bibliographies and a full index are provided.

ELEKTROTECHNIK.

Von J. Herrmann. Pt. 1, Die physikalischen Grundlagen. Vierte Auflage. (Sammlung Göschen.) Berlin, Vereinigung wissenschaftlicher Verleger, Walter de Gruyter & Co., 1922. 125 pp., plates, diagrams, 6 x 4 in., boards.

This is the first of four volumes intended as an introduction to heavy current engineering and is confined to the physical principles involved. The information is presented concisely, definitely, and without undue use of mathematics.

GRUNDZUGE DER ANGEWANDTEN ELEKTROCHEMIE.

Von Georg Grube. Bd. 1, Elektrochemie der Lösungen. Dresden und Leipzig, Theodor Steinkopff, 1922. 268 pp., illus., diagrams, 9 x 6 in., paper. \$1.68.

The "Principles of Electro-chemistry", of which this is the first volume, is intended to meet the need for a brief textbook of practical electro-chemistry in which special attention is given to technical applications. This volume contains the theoretical information necessary for a fruitful discussion of technical electro-chemical processes and discusses the electro-chemistry of solutions. It includes electro-metallurgical processes in solutions, the electrolysis of alkali chloride solutions, electrolytic oxidation processes, the electrolysis of water, and electrolytic reduction processes.

MASTERING POWER PRODUCTION.

By Walter N. Polakov. N. Y., Engineering Magazine Co., 1921. 455 pp., pl., diagrams, 9 x 6 in., cloth. \$5.00.

* Unless otherwise specified, books in this list have been donated by the publishers.

The subject of this volume is the technology of a method of mastering power production so that the best use of resources will be made under present social, economic, and political conditions. Mr. Polakov avoids discussion of the technical subjects already available in books on power engineering, and confines himself to the broader economic, psychological, and engineering features. Special attention is given to management problems. Contents: The Descent of the Principle of Production for Use; The Power Industry as an Economic Factor; The Location of Plants; The Equipment of Plants; Mastering Materials; Mastering Maintenance; Mastering Labor Problems; Mastering Processes; Mastering Records; The Analysis of Expenses; Power as a Commodity.

POWER ALCOHOL.

By G. W. Monier-Williams. (Oxford Technical Publications.) Lond., Frowde, 1922. 323 pp., illus., diagrams, 8 x 5 in., cloth. \$7.00.

The author has given in this volume a complete, well-balanced account of all the problems—engineering, chemical, and economic—associated with the production and utilization of alcohol as a motor fuel.

MODERN WORKSHOP PRACTICE.

By Ernest Pull. Sixth Edition. N. Y., D. Van Nostrand Co., 1922. 671 pp., pl., illus., diagrams, tab., 8 x 6 in., cloth. \$5.00.

A textbook for students and machinists' apprentices. Deals with the common bench and machine tools, gauges, lathes, lathe tools and fixtures, milling machines, planers, boring and slotting machines, and grinding machines. The author describes methods of bench work, heat treatment, soldering and brazing, twining, screw-cutting, gear-cutting, planing, shaping, drilling, and forging.

MACHINE TOOL OPERATION.

By Henry D. Burghardt. Pt. 2, Drilling Machine, Shaper and Planer, Milling and Grinding Machines. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1922. 438 pp., illus., diagrams, 8 x 5 in., cloth. \$2.75.

This volume is intended as a textbook for trade schools and apprentices, and follows one on lathe, bench, and forge work. The text treats of drilling, shaping, planing, milling, and grinding machines, emphasis being laid on the fundamental principles of their construction and operation. These principles are discussed thoroughly, as a foundation for rapid production.

GRADUATING, ENGRAVING, AND ETCHING.

(Machinery's Blue Books.) N. Y., Industrial Press; Lond., Machinery Publishing Co., 1921. 60 pp., illus., diagrams, 9 x 6 in., paper. 50 cents.

The methods presented in this pamphlet are those commonly used by manufacturers of tools and instruments to graduate straight and circular scales and to engrave or etch name plates, etc. The dividing engines and engraving machines available are described, and their use is explained.

DIE-CASTING.

(Machinery's Dollar Books.) N. Y., Industrial Press; Lond., Machinery Publishing Co., 1921. 108 pp., illus., diagrams, 9 x 6 in., paper. \$1.00.

The author describes briefly the development of die-casting machines, their commercial applications, and the alloys used for die-casting. These descriptions are based on contributions to *Machinery*, and are intended for those engaged in die-casting.

BEARINGS AND BEARING METALS.

(Machinery's Dollar Books.) N. Y., Industrial Press; Lond., Machinery Publishing Co., 1921. 120 pp., illus., diagrams, 9 x 6 in., paper. \$1.00.

A book of practical information upon plain bearings, in which the various types are shown and their suitability for various purposes explained. Information is also given on the composition and properties of bearing metals, the service to which they are adapted, and proper methods of lubrication.

ENGINES AND BOILERS.

By Thomas T. Eyrie. N. Y., The Macmillan Co., 1922. 234 pp., diagrams, 9 x 6 in., cloth. \$3.50.

An elementary course in heat engines for students of engineering, based on the author's experience in teaching engines and boilers and allied subjects at Purdue University.

20TH CENTURY GUIDE FOR DIESEL OPERATORS.

By Julius Rosbloom and Orville R. Sawley. Seattle, Western Technical Book Co., 1922. 637 pp., port., illus., diagrams, 9 x 6 in., cloth.

The authors have attempted to furnish in compact form a summary of present-day knowledge of Diesel engines and their auxiliary machinery. The information given is presented in a form suited to the needs of those in charge of power plants and covers both land and sea operation. Many commercial types of engines are described. One chapter is devoted to low-compression or "semi-Diesel" engines.

AMERICAN FUELS.

By Raymond Foss Bacon and W. A. Hamor. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1922. 2 vol., illus., diagrams, 9 x 6 in., cloth. \$12.00.

The editors of this volume have attempted to condense into a series of especially prepared chapters the fruits of the experience of specialists, and thus present an authoritative account of all American fuels of technical importance. It is intended to give informative summaries of sound practice and provide such information as will assist the engineer to decide on the most suitable fuel to use or the changes to make in using fuel or heat in order to get the highest efficiency in plant operation.

LIQUID FUEL AND ITS APPARATUS.

By Wm. H. Booth. Second Edition. N. Y., E. P. Dutton and Co., 1922. 308 pp., illus., diagrams, 9 x 6 in., cloth. \$4.00.

The object of this book is to present in a handy form the more practical points of the author's larger book, "Fuel and Its Combustion". The present book is fairly closely confined to the use of liquid fuel under boilers and in internal combustion engines. It discusses the principles of liquid fuel and the properties of fuel oils, gives examples of practice in using oil fuel for stationary boilers, locomotives, and oil engines, and discusses burners and the storage, distribution, and atomizing of oil.

DIE WARME-EIN GAS.

Von Lothar Fischer. Leipzig, H. A. Ludwig Degener, 1922. 61 pp., 9 x 6 in., paper. 38 marks.

This pamphlet is an attack on current opinion concerning the nature of heat. Heat is, according to this author, a gas. This gas he conceives as having an atomic weight far below that of hydrogen, and molecules of such minuteness that they diffuse easily through all substances. His monograph presents reasons for this opinion.

BEITRAG ZUR BERECHNUNG DER DAMPFTURBINEN AUF ZEICHNERISCHER GRUNDLAGE.

Von Erich Henne. (Forschungsarbeiten auf dem Gebiete des Ingenieurwesens. Heft. 260). Berlin, Julius Springer, 1922. 58 pp., diagrams, chart, 10 x 7 in., paper. 20 marks.

Describes a simplified method of determining the dimensions of the stages of a turbine, for any given efficiency, by means of graphic charts. The charts are given in the book, with examples of their use. They are based on the relation between the indicated efficiency, speed of revolution, and the heat drop discovered by Loschge. By use of the charts, the author claims, much wearisome calculation can be avoided without any loss of accuracy.

CONSERVATION OF NATURAL GAS IN KENTUCKY.

By Willard Rouse Jillson. Louisville, Ky., John P. Morton & Co., 1922. 152 pp., illus., 8 x 5 in., cloth.

Dr. Jillson's little book is intended to call the attention of those interested in Kentucky to the urgent necessity of conserving the natural gas reserves of the State, and to indicate the necessary steps to prevent waste. Incidentally, the book provides a good summary of the gas resources and industries of Kentucky. It should prove valuable both to producers and consumers of gas, by calling attention to the consequences of waste, and by its specific recommendations for conservation.

COAL TRADE.

By Sydney A. Hale. Forty-eighth Annual Edition. N. Y., Estate of F. E. Saward, 1922. 254 pp., 8 x 6 in., cloth. \$3.00.

A statistical and economic review of the coal and coke industry during 1921. Figures and information concerning production, prices, market conditions, exports, and imports, for anthracite, coke, briquettes, and bituminous coal are presented; miscellaneous transportation statistics of interest to dealers in coal are given, and export trade is discussed.

RAPPORTS DES INGENIEURS DES MINES SUR LA SITUATION DES MINES

En 1919 et 1920. Published by Comité Central des Houillères de France. Paris, 1922. 237 pp., tab., 11 x 9 in., paper.

The two reports that make up this volume, give an extended account of coal mining operations in France during 1919 and 1920. Tables show the output, prices, number of workers, accidents, etc., for the mines in each district.

SPACE—TIME—MATTER.

By Hermann Weyl. N. Y., E. P. Dutton & Co., 1922. 330 pp., diagrams, 9 x 6 in., cloth. \$7.50.

Although many popular introductions to the general theory of relativity have appeared, systematic presentations are not common, and for this reason this translation of the leading German work on the subject is welcome. In it are given all the details of the mathematical reasoning required for a thorough understanding of the subject. The author's extension of the theory to include electromagnetic phenomena is given in full.

SIX-PLACE TABLES.

N. Y. and Lond., McGraw-Hill Book Co., 1922. 124 pp., 7 x 4 in., fabrikoid. \$1.25.

This volume contains a selection of tables of squares, cubes, square roots, cube roots, fifth roots, and powers, circumferences and areas of circles, logarithms of numbers, logarithms of trigonometric functions, and natural trigonometric functions, arranged to meet the need for a volume of pocket size, containing the tables in regular, continuous use by students and engineers.

TREATISE ON BESSEL FUNCTIONS.

By Andrew Gray and G. B. Mathews. Second Edition. Lond., Macmillan & Co., 1922. 327 pp., 9 x 6 in., cloth. \$12.00.

This book has been written in view of the great and growing importance of the Bessel functions in almost every branch of mathematical physics; and its principal object is to supply in a convenient form so much of the theory of functions as is necessary for their practical application, and to illustrate their use by a selection of physical problems, worked out in some detail. This new edition has been thoroughly revised. The earlier chapters have been rewritten, examples have been appended, and additions have been made to the tables. A bibliography is included.

LES AXIOMES DE LA MECANIQUE.

Par Paul Painlevé. (*Les Maitres de la Pensée Scientifique.*) Paris, Gauthier-Villars et Cie., 1922. 111 pp., 7 x 5 in., paper.

In this small book, Prof. Painlevé sets forth, with a minimum of mathematical terminology, the axioms of mechanics, as laid down by the founders of the science. From these he proceeds to a description of the modifications proposed by recent theories. His book is, therefore, not only a thorough study of the fundamental axioms of the subject, but also an introduction to the theory of relativity.

FACTORY STORESKEEPING.

By Henry H. Farquhar. N. Y. and Lond., McGraw-Hill Book Co., 1922. 182 pp., illus., 9 x 6 in., cloth. \$2.50.

The materials considered in this book are the stores of raw materials and factory supplies, worked materials or work in process, and partly or completely finished parts. The book deals with the replenishment, storage, and disbursement of these two classes of materials, but excludes the administration of work in process. The author outlines the principles and methods by which this problem may be solved and a system may be developed to suit local conditions, but he does not outline a system for any specific type of factory.

GRAPHIC CHARTS IN BUSINESS.

By Allan C. Haskell. N. Y., Codex Book Co., 1922. 250 pp., charts, 9 x 6 in., cloth. \$4.00.

A companion volume to the author's earlier book, "How to Make and Use Graphic Charts". The present work is confined to charts generally used for business purposes, line, bar, circular percentage, organization, trilinear, and probability charts. Methods of making these charts are explained, their adaptability for various purposes is set forth, and their application in various departments of business organizations illustrated. The ratio chart is explained fully. A bibliography is included. The book is intended to help the man of business see when and how graphic charts can serve his purposes in controlling business operations.

CHEMISTRY AND TECHNOLOGY OF GELATIN AND GLUE.

By Robert Herman Bogue. N. Y. and Lond., McGraw-Hill Book Co., 1922. 644 pp., illus., diagrams, 9 x 6 in., cloth. \$6.00.

Reliable information on the manufacture, testing, analysis, and general applications of gelatin and glue has been difficult to obtain by students and investigators, and information on the chemistry of these substances has been even scarcer. The author has attempted to meet these wants, and particularly to correlate and summarize the work done during the past decade on the chemistry of gelatin. His book is directed toward the chemist and research student, rather than the plant technologist, but contains much of interest to the latter.

PRACTICAL ACCOUNTING FOR GENERAL CONTRACTORS.

By H. D. Grant. N. Y. and Lond., McGraw-Hill Book Co., 1922. 254 pp., forms, 9 x 6 in., cloth. \$3.00.

The author states that, although many excellent books on general accounting exist, as well as many on accounting in various industries, little has been written to fit the needs of the contractor. He has prepared therefore this description of a system which will enable the contractor to co-ordinate and control his operations so that the status of his contracts may be ascertained at all times.

RAILWAY ELECTRIC TRACTION.

By F. W. Carter. N. Y., Longmans, Green & Co.; Lond., Edward Arnold & Co., 1922. 412 pp., diagrams, 9 x 6 in., cloth. \$8.50.

This book discusses the methods of electric traction as applied to railways and expounds methods of technical calculation applicable to the subject. In pursuance of the first objective, the author attempts to determine what constitutes good practice and why. The methods of calculation described are for the most part the author's own. The work affords a broad view of the principles underlying electric railways, unencumbered by superfluous descriptive matters.

MOSQUITO ERADICATION.

By W. E. Hardenburg. N. Y. and Lond., McGraw-Hill Book Co., 1922. 248 pp., illus., 9 x 6 in., cloth. \$3.00.

This book contains a concise account of the injury done by mosquitoes, the varieties found in America, the development of control measures, and current practice in mosquito control. Directions for organizing and administering campaigns are given, as well as information concerning the necessary engineering and other measures of most value.

TEXTBOOK OF THE MATERIALS OF ENGINEERING.

By Herbert F. Moore. Third Edition. N. Y. and Lond., McGraw-Hill Book Co., 1922. 315 pp., illus., diagrams, 9 x 6 in., cloth. \$3.00.

A concise presentation of the physical properties of the common materials used in structures and machines, with brief descriptions of their manufacture and fabrication, is given by the author. The subject-matter is elementary in character and intended for use in technical schools, in connection with courses in the mechanics of materials. Bibliographies are appended to each chapter. This edition has been revised in the light of recent experimental data.

MATERIALS OF CONSTRUCTION.

By H. E. Pulver. (Engineering Education Series.) N. Y. and Lond., McGraw-Hill Book Co., 1922. 318 pp., illus., diagrams, 9 x 6 in., cloth. \$3.00.

This book has been prepared primarily for correspondence study in the University of Wisconsin, but it will also, the author believes, prove useful for residence study in technical schools. The ordinary materials, plasters, cements, mortars, concrete, stone, brick, timber, and metals, are described, and their structural properties explained, in an elementary way.

NEW BUILDING ESTIMATORS' HANDBOOK.

By William Arthur. 1922 Edition. N. Y., U. P. C. Book Co., 1922. 1002 pp., illus., tab., 7 x 5 in., fabrikoid. \$6.00.

This well-known handbook has been revised, and reset in a smaller, although legible type, so that its size has not been increased. It is intended to assist architects, builders, contractors, and engineers in estimating the cost of new construction and repairs in all lines of building work, excavating, and municipal work.

ARCHITECTURAL DRAWING.

By Wooster Bard Field. N. Y. and Lond., McGraw-Hill Book Co., 1922. 161 pp., illus., 12 x 10 in., cloth. \$4.00.

An effort has been made to provide those things which are of fundamental importance to the student in his initial study of the subject, together with a careful presentation of some of the important points that are usually left to be acquired during his office experience. The book should also be valuable to any one who deals with architectural work.

LITTLE BOOK ON WATER SUPPLY.

By William Garnett. Cambridge, University Press, 1922. 144 pp., illus., 9 x 6 in., cloth. \$2.50. (Gift of the Macmillan Co., N. Y.)

A general account of the sources and mode of supply of water, with particular reference to the water supply of London, England. The text is intended for use in elementary schools or in conjunction with illustrated lectures in schools of hygiene.

HYDRAULICS.

By Horace W. King and C. O. Wisler. N. Y., John Wiley & Sons; Lond., Chapman & Hall, 1922. 237 pp., diagrams, 9 x 6 in., cloth. \$2.75.

This book deals with the fundamental principles of hydraulics and their application in engineering practice. Although many formulas applicable to different types of problems are given, the aim has been to bring out clearly and logically the underlying principles that

form the basis of such formulas, rather than to emphasize the importance of the formulas themselves. The book is intended as a text for beginners and a reference book for engineers interested in the fundamental principles.

HYDRAULIC DIAGRAMS FOR THE DISCHARGE OF CONDUITS AND CANALS.

By Theodore Horton and C. H. Swan. Third Edition. N. Y. and Lond., McGraw-Hill Book Co., 1922. 53 pp., diagrams, 9 x 6 in., paper. \$1.00.

This set of diagrams is intended for use in the study of those sections of conduits and canals which are commonly used in sewerage, water supply, water power, and drainage. The set includes conduits of ten different types of cross-section and canals of rectangular and trapezoidal cross-section. In this edition, one diagram previously used has been replaced by three new diagrams of more useful types, and the text has been revised and extended.

WAVE TRANSMISSION.

Proprietor and Patent Owner: Walter Haddon. Third Edition. Lond., 1922. 53 pp., illus., paper.

Wave transmission is the name chosen to designate the method for transmitting power invented in 1913 by George Constantinesco, in which the power is transmitted through waves or pulsations set up in an enclosed column of liquid. This pamphlet calls attention to the possibilities of the method as a substitute for others, particularly for hydraulic and compressed air transmission, and describes the wave generators and rock drills now on the market.

UNTERSUCHUNGEN UBER LAMINARE UND TURBULENTE STROMUNG.

Von L. Schiller. (Forschungsarbeiten auf dem Gebiete des Ingenieurwesens. Heft. 248.) Berlin, Julius Springer, 1922. 36 pp., diagrams, 10 x 7 in., paper. 30 marks.

The author gives herein the results of an exhaustive new investigation of laminar and turbulent flow in pipes, especially of the influence of various factors on the "critical" number. Certain variations from Poiseuille's law were detected, which had not been noticed by previous investigators, and an explanation is provided for them. In addition to its theoretical importance, this investigation should be of practical value, for it opens the way for the determination of viscosities by means of short tubes and makes possible the determination of absolute viscosity with the well-known Engler viscosimeter.

CURRENT CIVIL ENGINEERING LITERATURE

KEY TO ABBREVIATED REFERENCES TO PUBLICATIONS INDEXED*

Abbreviated References.	Publication.	Place.
Am. C. Inst.....	American Concrete Institute, Proceedings (Y.)	Detroit
A. I. E. E.....	American Institute of Electrical Engineers, Journal (M.)	New York
A. R. E. A.....	American Railway Engineering Association, Proceedings (Y.)	Chicago
A. S. T. M.....	American Society for Testing Materials, Proceedings (Y.)	Philadelphia
Am. Soc. C. E.....	American Society of Civil Engineers, Proceedings (M.)	New York
Am. Soc. Mun. Impvts.....	American Society for Municipal Improvements, Proceedings (Y.)	New York
Am. W. W. Assoc.....	American Waterworks Association, Journal (Bi-M.)	Baltimore
Am. Wood Prs. Assoc.....	American Wood Preservers Association, Proceedings (Y.)	Baltimore
Ann. P. et C.....	Annales des Ponts et Chaussées (Bi-M.)	Paris
Ann. T. P. Belg.....	Annales des Travaux Publics de Belgique (Bi-M.)	Brussels
Assoc. Ing. Gand.....	Annales de l'Association des Ingénieurs sortis des Ecoles Spéciales de Gand (Q.)	Ghent
Bost. Soc. C. E.....	Boston Society of Civil Engineers, Journal (M.)	Boston
Can. Engr.....	Canadian Engineer (W.)	Toronto
Cem. Eng.....	Cement and Engineering News (M.)	Chicago
Cornell C. E.....	Cornell Civil Engineer (M.)	Ithaca
Dock & Harbour.....	Dock and Harbour Authority (M.)	London
Eisenbau	Der Eisenbau (M.)	Leipzig
Eng.	Engineering (W.)	London
Eng. & Contr.....	Engineering and Contracting (W.)	Chicago
Eng. Inst. Can.....	Engineering Institute of Canada, Journal (M.)	Montreal
Eng. N. R.....	Engineering News-Record (W.)	New York
Engrs. Club, St. L.....	Engineers Club, St. Louis, Journal (Bi-M.)	St. Louis
Engrs. Soc. Pa.....	Engineers' Society of Pennsylvania, Journal (M.)	Harrisburg
Engrs. Soc. W. Pa.....	Engineers' Society of Western Pennsylvania, Journal (M.)	Pittsburgh
Engr.	Engineer (W.)	London
Engrs. & Eng.....	Engineers and Engineering, Engineers' Club of Philadelphia (M.)	Philadelphia
Gen. Civ.....	Le Génie Civil (W.)	Paris
Gesund. Ing.....	Gesundheits Ingenieur (W.)	Munich
Inst. C. E.....	Institution of Civil Engineers Minutes of Proceedings (Q.)	London
Inst. Mun. & Co. Engrs.....	Institution of Municipal and County Engineers, Journal (W.)	London
Int. Ry. Assoc.....	International Railway Association, Bulletin (M.)	Brussels
Land. Arch.....	Landscape Architecture (M.)	Harrisburg
Mech. Eng.....	Mechanical Engineering (M.) Journal of the American Society of Mechanical Engineers	New York
Mil. Engr.....	Military Engineer (M.)	Washington
Min. & Metal.....	Mining and Metallurgy (M.) American Institute of Mining Engineers	New York
Mun. & Co. Eng.....	Municipal and County Engineering (M.)	Indianapolis
N. E. W. W. Assoc.....	New England Water Works Association, Journal (M.)	Boston
N. Y. R. R. Club.....	New York Railroad Club, Proceedings (M.)	Brooklyn
Oest. Ing. Arch. Ver.....	Oesterreichischer Ingenieur und Architekten Verein, Zeitschrift (W.)	Vienna
Power	Power (W.)	New York
Rev. Gen.....	Revue Générale des Chemins de Fer (M.)	Paris
Ry. Age.....	Railway Age (W.)	New York
Ry. Main. Engr.....	Railway Maintenance Engineer (M.)	Chicago
Ry. Rev.....	Railway Review (W.)	Chicago
Schw. Bauz.....	Schweizerische Bauzeitung (W.)	Zurich
Sci. Am.....	Scientific American (M.)	New York
Soc. Ing. Civ. Fr.....	Société des Ingénieurs Civils de France, Mémoires et Comptes Rendus (Q.)	Paris
Ver. deu. Ing.....	Verein deutscher Ingenieure, Zeitschrift (W.)	Berlin
West. Ry. Club.....	Western Railway Club, Proceedings (M.)	Chicago
West. Soc. Engrs.....	Western Society of Engineers, Journal (M.)	Chicago
Zeit. Bau.....	Zeitschrift für Bauwesen (Q.)	Berlin
Z. d. Bauver.....	Zentralblatt der Bauverwaltung (Semi-Weekly)	Berlin

* Y = Yearly; Q = Quarterly; M = Monthly; F = Fortnightly; W = Weekly.

A. Applied Sciences

a. Processes of Calculation

2. Graphical and Nomographical

Règle Logarithmique, Système Rieger, pour le Calcul des Constructions en Beton Armé. Application au Calcul de la Flexion Composée.* (Rieger System Logarithmic Rule for Calculation of Reinforced Concrete Construction Application to the Calculation of Compound Deflections.) J. Rieger. Gen. Civ. Aug. 12, '22.

B. Applied Mechanics

a. Mechanics of Solids (Strength of Materials)

2. Elastic Solids

Die Drehungsfestigkeit von Stäben.* (Resistance of Bars to Twisting.) Constantin Weber. Ver. deu. Ing. Aug. 12, '22.

Zur Berechnung der Knickfestigkeit von Stäben mit mehreren Feldern.* (The Calculation of the Bending Resistance of Members with Several Bays.) Zimmerman. Z. d. Bauver. Aug. 12, '22.

4. Riveted Systems

Some Data on the Design of Steel Coal Bins.* R. Fleming Eng. N. R. Aug. 31, '22.

b. Hydraulics

3. Industrial Hydraulics

Turbines for the Great Falls Development of the Manitoba Power Company.* H. S. VanPatter. Eng. Inst. Can. Sept., '22.

Queenston-Chippawa Power Development.* H. G. Acres and others. Engrs. & Eng. Serial beginning Aug., '22.

Extension to the Hydro-Electric System of the City of Winnipeg.* E. V. Caton. Eng. Inst. Can. Sept., '22.

Wasserkräftanlagen mit stehenden Turbinen, Zahnrädergetrieben und Schirmdynamos.* (Water Power Plants with Vertical Turbines, Geared Transmission and Screened Dynamos.) E. Treiber. Ver. deu. Ing. July 22, '22.

Der Schrägaufzug für das Spullerseewerk.* (The Inclined Elevator for the Spullersee Plant.) Rob. Findeis. Oest. Ing. Arch. Ver. Aug. 4, '22.

Stand der Bauarbeiten beim Kraftwerk Partenstein. (Present Stage of the Construction Work of the Partenstein Power Station.) Oest. Ing. Arch. Ver. Aug. 4, '22.

Wirtschaftlichkeit und Ausbau der Wasserkräftanlagen in Oesterreich.* (Economy and Extension of the Austrian Water Power Plants.) L. Rosenbaum. Oest. Ing. Arch. Ver. Aug. 4, '22.

Wasserkräftanlagen mit gleichbleibender Kraftleistung.* (Water Power Plants with Constant Power Factor.) Janesch. Oest. Ing. Arch. Ver. Aug. 4, '22.

Finnlands Wasserkräfte.* (Water Powers of Finland.) Schw. Bauz. Aug. 5, '22.

Die projektierten Kraftwerke am Hinterrhin. (The Projected Power Plant on the Lower Rhine.) Schw. Bauz. Aug. 5, '22.

Der "Stossverlust" des Wassers beim Eintritt in Schaufelsysteme.* (The "Loss by Shock" of Water When Entering Blade Systems.) D. Thoma. Schw. Bauz. Aug. 19, '22.

c. Pneumatics

3. Industrial Pneumatics

Replacing Cables on a Two to One Traction Elevator Machine.* F. A. Annett. Power Sept. 5, '22.

Etude des Compresseurs d'Air.* (A Study of Air Compressors.) R. Pérot. Gen. Civ. Aug. 26, '22.

Untersuchungen an Luftpumpen für Kondensatoren.* (Investigations of Air Pumps for Condensers.) K. Hoefer. Ver. deu. Ing. July 22, '22.

C. Materials of Construction and General Processes

a. Lime, Cement, Mortar, Concrete, Brick, Bitumen, Timber, etc.

Quality Control in Cement Manufacture. Richard K. Meade. (Paper read before Portland Cement Assoc.) Cem. Eng. Aug., '22; Can. Engr. Aug. 22, '22.

Brickwork from Building Stronger Than Laboratory Samples.* Rudolph P. Miller. Eng. N. R. Aug. 31, '22.

Tests of Concrete in Sea Water.* L. C. Wason. Am. Soc. C. E. Sept., '22.

Some Fallacies in Concrete Proportioning Theories. G. M. Williams. Eng. Inst. Can. Sept., '22.

The Chemistry of Portland Cement and Its Disintegration by Alkaline Ground Waters. T. Thorvaldson. Eng. Inst. Can. Sept., '22.

Effect of Age on the Strength of Concrete.* Duff A. Abrams. Eng. & Contr. Sept. 6, '22.

Testing Hollow Building Tile.* Wm. B. Newhall. Eng. N. R. Sept. 7, '22.

Das Wärmeschutzvermögen von Baustoffen nach dem Verfahren des staatlichen Materialprüfungsamts. (Ziegel und Kalksandstein).* (Heat Insulating Capacity of Building Material According to the Proceedings of the Government Material Testing Station. (Brick and Calcareous Sandstone.) Z. d. Bauver. Aug. 9, '22.

c. Preservation and Use of Materials. Painting, Waterproofing

Paint Protection for Wood.* Cornelius T. Myers. Mech. Eng. Aug., '22.

h. Foundations

- Rock Borings for Highway Bridge Piers Made with Well Drilling Machine.* N. H. Meriwether. Eng. & Contr. Sept. 6, '22.
- Modified U-Type of Abutment as Used in Wyoming.* J. F. Seiler. Eng. N. R. Sept. 14, '22.
- Fundamente für Grosskraftmaschinen.* (Foundations for Large Prime Movers.) August Wolfholz. Ver. deu. Ing. Aug. 12, '22.

j. Piles and Pile-Driving

- Der Wolfholzsche Presszementpfahl und seine Berechnung.* (The Wolfholz Molded Cement Pile and Its Calculation.) Joachim Schultze. Z. d. Bauver. Aug. 9, '22.

k. Tunnels and Tunneling-Shields

- Caribou Tunnel Driven Under Heavy Inflow of Water.* W. D. Shannon. Eng. N. R. Aug. 31, '22.

i. Construction Machinery and Tools. Drainage

- Wirtschaftlicher Betrieb der Baumaschinen.* (Economic Operation of Building Machinery.) Friedrich Merkel. Ver. deu. Ing. Serial beginning July 29, '22.

D. Highways**b. Load Resistance**

- Sur l'Usure des Routes par les Camions Montés sur Bandages Pleins et les Camions Munis de Pneumatiques.* (On the Wear of Roads by Trucks Mounted on Plain Tires and Trucks with Pneumatic Tires). M. Bonfils. Ann. P. et C. May-June, '22.

c. Construction

- Comparison of Sub-Drainage by Deep Side Ditches and Tile Drains. C. H. Upham. (Paper read before Univ. of Michigan.) Can. Engr. Aug. 29, '22.
- Strengthening Gravel Roads with Tar Surface Treatments at Elgin, Ill. Geo. E. Martin. Mun. & Co. Eng. Sept., '22.
- Drainage Expert Discusses Highway as Compared with Agricultural Drainage.* Edgar A. Rossiter Mun. & Co. Eng. Sept., '22.
- Construction of Reinforced Concrete Section of Lee Highway at Pulaski, Va. G. H. Derrick. Mun. & Co. Eng. Sept., '22.
- Tar Surface Treatment of Gravel Roads in Maine. Paul D. Sargent. (Paper read before Univ. of Mich.) Mun. & Co. Eng. Sept., '22.
- Asphaltic Cement Specifications. Gene Abson. Mun. & Co. Eng. Sept., '22.
- Drainage for Roads in Prairie Regions. H. R. Mackenzie. (Paper read before Canadian Good Roads Assoc.) Eng. & Contr. Sept. 6, '22.
- Road Construction in Prairie and Timbered Country. J. D. Robertson. (Paper read before Canadian Good Roads Assoc.) Eng. & Contr. Sept. 6, '22.
- Importance of Plant Inspection in Bituminous Pavement Construction. Francis P. Smith. (From paper read before Univ. of Michigan.) Eng. & Contr. Sept. 6, '22.
- How Iowa Levies Assessments for Surfacing County Roads. F. W. Parrott. (From Iowa Eng. Soc. Proceedings.) Eng. & Contr. Sept. 6, '22.
- Experiments in Improving Prairie Roads. K. A. Clark. (Paper read before Canadian Good Roads Assoc.) Eng. & Contr. Sept. 6, '22.
- Slag-Concrete Roads—Their Construction and Wear. C. S. Hill. Eng. N. R. Sept. 14, '22.
- "Inverted Penetration" Macadam Roads in Texas.* A. D. Stivers. Eng. N. R. Sept. 21, '22.

d. Maintenance

- Highway Maintenance in Bureau County, Illinois. C. L. Melcher. (Paper read before Univ. of Ill.) Mun. & Co. Eng. Sept., '22.
- Utilizing Existing Road Metal in New Construction.* G. F. Schlesinger. Eng. N. R. Sept. 14, '22.
- Pavement Maintenance Experience in Wichita, Kansas.* P. L. Brockway. Eng. N. R. Sept. 7, '22.

e. Street Cleaning, Dust Prevention, Snow Removal

- Snow Removal on Interurban Highways. C. J. Bennett. (From paper read before Univ. of Michigan.) Eng. & Contr. Sept. 6, '22.

f. Tree Planting

- Selection, Arrangement and Planting of Road Side Trees.* C. F. Boehler. (From *Michigan Roads and Forests*) Eng. & Contr. Sept. 6, '22.

g. Machinery and Tools

- Concrete Hauled from Central Mixing Plant on State Highway Job in Walla Walla County, Wash.* Eugene R. Hoffman. Cem. Eng. Sept., '22.
- Contractor Makes Ingenious Use of Available Equipment for Central Mixing Plant.* Cem. Eng. Sept., '22.

h. Vehicles. Automobiles

- Highway Curves and Traffic Safety. H. Eltinge Breed. (Comm. Report read before National Highway Assoc.) Can. Engr. Aug. 29, '22.

E. Bridges, Viaducts, and Arches

a. Timber Bridges and Viaducts

Bridge Inspection and Maintenance on Interurban Railway. J. H. Hyatt. (From *Electric Traction.*) Engr. & Contr. Sept. 20, '22.

d. Concrete and Reinforced Concrete Bridges

Special Form Work for Black Street Bridge, Hamilton, O.* (From *Miami Conservancy Bulletin.*) Eng. & Contr. Aug. 28, '22.

Special Trussed Falsework for Concrete Arch.* Merrill Butler. Eng. N. R. Sept. 21, '22. La Répartition des Charges entre les Poutres dans les Ponts en Béton Armé.* (Distribution of Loads between the Girders in Reinforced Concrete Bridges.) Maximilien Thullie. Gen. Civ. Aug. 19, '22.

Der Neubau der Mersey-Brücke bei Warrington.* (The Rebuilding of the Mersey Bridge at Warrington.) Eger. Z. d. Bauver. Aug. 2, '22.

f. Suspension Bridges. Transfer Bridges

Building the Rondout Creek Highway Suspension Bridge.* W. E. Joyce and M. Bebarfald. Eng. N. R. Sept. 14, '22.

g. Swing, Bascule, Lift, Floating, Oscillating Bridges; Traveling Cranes

Riachuelo Transporter Bridge, Buenos Aires.* J. P. Risdon. Eng. Serial beginning Aug. 18, '22.

Bascule Highway Bridge, Port Dover, Ontario.* E. H. Darling. Aug. 29, '22. Pont Levant sur le Canal du Midi, à Béziers (Hérault).* Lift Bridge Over the Midi Canal at Béziers (Hérault). Gen. Civ. July 29, '22.

Pont Basculant en Arc à deux Travées, à Caorle (Vénétie).* (Arched Bascule Bridge with Two Bays, at Caorle (Venice).) Gen. Civ. Aug. 5, '22.

x. Miscellaneous

Artistic Design of Bridges. Charles Evan Fowler. (Paper read before Civil Engrs.' Club of Univ. of Toronto.) Eng. & Contr. Aug. 23, '22.

F. Inland Waters

a. Natural Waterways (General Articles)

The Outlets of the Danube.* Dock & Harbour. Sept., '22.

b. Canals (General Articles)

The Caledonian (Ship) Canal.* Eustace W. Porter. Dock & Harbour Sept., '22.

c. Regulation of Waterways. Volume of Discharge, Freshets, Floods, Soundings

Der Sturzregen im Emschergebiet am 31 Juli und 1 August, 1917.* (The Heavy Downpour in the Emscher Region on July 31st and August 1st, 1917.) Hummell. Z. d. Bauver. Aug. 2, '22.

Die Rhein-Regulierung Strassburg-Basel nach dem schweiz. Projekt vom September, 1921.* (Regulation of the Rhine, Strasbourg-Bâle, According to the Swiss Plan of September, 1921.) Schw. Bauz. Serial beginning Aug. 12, '22.

g. Consolidation of Banks, Leakage, Maintenance of Channel, Dredging

The Meuse Lock on the Meuse-Waal Canal.* L. R. Wentholt. Engr. Serial beginning Sept. 8, '22.

Emergency Revetment on River Diversion Channel.* E. S. Blaine. Eng. N. R. Sept. 14, '22.

J. River and Lake Ports, Equipment

Large Hollow Concrete Blocks Form Dock Wall.* Cem. Eng. Sept., '22.

k. Utilization of Inland Waterways, Freight, Capacity

Der Oberrhein und die Zentralkommission für die Rheinschiffahrt.* (The Upper Rhine and the Central Commission for the Navigation of the Rhine.) Hoebel. Z. d. Bauver. Aug. 5, '22.

G. Maritime Works

a. Behavior of Movements of the Ocean. Winds. Waves. Tides. Currents

Veränderung der Hochwasserwellen durch natürliche oder künstliche Seeflächen.* (Modification of High Waves by Natural or Artificial Calming of the Sea.) Liczewski. Z. d. Bauver. Aug. 28, '22.

c. Vessels and Maritime Navigation. Lighthouses. Buoys. Various Signals

Ward and Operating Room Ventilation on Board Hospital Ship *Relief*.* R. C. Holcomb. Engrs. & Eng. Sept., '22.

Le Nouveau Paquebot *Majestic* (Ex-*Bismarck*).* (The New Packet *Majestic* (ex-*Bismarck*)). P. Calfas. Gen. Civ. July 29, '22.

f. Maritimè Rivers and Canals. Bank Protection

Contribution à l'Etude Théorique des Fleuves à Marées et Application aux Rivières du Bassin de l'Escaut Maritime.* (Contribution to the Theoretical Study of River Tides, and an Application to the Basin of the Maritime Escaut.) L. Bonnet. Ann. T. P. Belg. Pt. 3, '22.

Sur la Théorie des Marées Fluviales et ses Applications.* (On the Theory of River Tides and Their Applications.) M. Ribière. Ann. P. et C. May-June, '22.

h. Wharves. Mooring Buoys. Harbor Equipment

Special Formwork Required in Setting Wharf Piers.* S. Kent. Eng. N. R. Aug. 31, '22.

i. Harbors (General Articles)

Two Ports of Puget Sound.* Taggart Ashton. Dock & Harbour Sept., '22.
Report Plans for Development of Shanghai Harbor.* Eng. N. R. Sept. 14, '22.
Construction Features of Harbor Works at Valparaiso. (From *Times Engineering Supplement*.) Eng. & Contr. Aug. 30, '22.

Les Travaux du Port de Tanger. Concours pour l'Adjudication des Travaux d'Infrastructure.* (The Tangier Harbor Works. Competition for the Contract for the Masonry Work.) Gen. Civ. Aug. 19, '22.
Erweiterungen des Hafens von Rotterdam.* (Harbor Enlargement at Rotterdam.) Hetzel. Z. d. Bauver. Aug. 19, '22.

j. Dockyard Machinery and Shipyards. Drydocks

Die Erweiterung des König-Albert-Docks in London.* (Enlargement of the King Albert Docks at London.) Eger. Z. d. Bauver. Aug. 9, '22.

H. Railroads. Street and Interurban Railways. Automobiles. Aeronautics**a. Railroads****1. General Articles**

Bolivian State Railway Being Built by Americans. Eng. N. R. Aug. 31, '22.
The Application of Engineering in Railroad Transportation. G. D. Brooke. West. Soc. Engrs. Sept., '22.

The Japanese Railways and Their Operating Problems.* H. K. Smith. Ry. Rev. Sept. 16, '22.

Note sur les Chemins de Fer de la Ruhr.* (Note on the Ruhr Railroads.) M. Andriot. Rev. Gen. Aug., '22.

Massegebende Größen für die Anlage von steigenden Eisenbahnstrecken und für den Betrieb auf ihnen.* (Standard Dimensions for the Construction of Inclined Sections of Railroads and for Operating on Them.) L. Bräuler. Z. d. Bauver. Aug. 26, '22.

4. Track

Chicago Track Elevation Structures Being Strengthened.* Ry. Main. Engr. Sept., '22.
Burlington Creosotes Cypress Piles.* G. A. Haggander. Ry. Main. Engr. Sept., '22.

5. Signals and Safety Apparatus

Long Distance Operation of Railway Facing Points.* Engr. Sept. 1, '22.

The Union System of Automatic Train Control.* L. V. Lewis. (From paper read before Railway Club of Pittsburgh.) Ry. Rev. Sept. 16, '22.

6. Rolling Stock (Locomotives, Cars)

Some Factors to be Considered in Freight Car Design.* H. W. Williams. Ry. Rev. Aug. 26, '22.

Mechanical Refrigeration of Railroad Cars.* W. M. Baxter. Mech. Eng. Sept., '22.

Automatic Box Car Unloaders for Grain.* F. Newell. Eng. Inst. Can. Sept., '22.

Michigan Central Mikado has Many Special Features.* Ry. Age Sept. 2, '22.

Locomotive Power.* E. C. Poultney. Engr. Sept. 8, '22.

Steel Diners for the Atchison, Topeka & Santa Fe.* Ry. Age Sept. 9, '22.

The Una-Flow Locomotive—Practical Possibly.* Ry. Rev. Sept. 9, '22.

Dynamometer Tests of the Locomotive Booster.* Ry. Age Sept. 16, '22.

Les Nouvelles Voitures Lits de la Compagnie Internationale des Wagons—Lits.* (The New Sleeping Cars of the Compagnie Internationale des Wagons-Lits.) M. Doassans. Rev. Gen. Aug., '22.

Locomotive Electriques des Chemins de Fer Féderaux Suisses Type 1 B1—B1. Construites par les Ateliers de Sécheron.* (Electric Locomotives of the Swiss Federal Railways, Type 1 B1—B1. Built by the Secheron Works.) G. L. Meyfarth. Gen. Civ. Aug. 12, '22.

Chevalet de 100 Tonnes, Système Perbal, pour le Levage des Locomotives.* (Perbal System 100-Ton Trestle for Lifting Locomotives.) Gen. Civ. Aug. 12, '22.

Heizwagen mit Elektroden-Kessel für 15 000 Volt der Schweizer, Bundesbahnen.* (Heating Car with 15 000-Volt Electrode Boilers of the Swiss Federal Railroad.) F. Christen. Schw. Bauz. Aug. 5, '22.

Die Einphasen-Lokomotiven Typ 1-B-1 + B-1 der Ateliers de Sécheron, Genf, für die S. B. B.* (The Single-Phase Locomotives, Type 1-B-1 + B-1 of the Secheron Shops, Geneva, for the Swiss Federal Railroad.) G. L. Meyfarth. Schw. Bauz. Serial beginning Aug. 26, '22.

7. Use of Electricity

Survey of Electric Traction on American Railroads.* George Gibbs. Eng. N. R. Sept. 14, '22.

Steam Road Electrifications in the Argentine.* Lynn G. Riley. Ry. Age Aug. 26, '22.

Travaux et Projets d'Electrification de la Compagnie des Chemins de Fer du Midi.* (Electrification Works and Plans of the Compagnie des Chemins de Fer du Midi.)

M. Fontaine. Ann. P. et C. May-June, '22.

L'Electrification des Chemins de Fer au Moyen de Courants Alternatifs de Fréquence Elevée.* (Railroad Electrification with High Frequency Alternating Currents.) Gen. Civ. Aug. 26, '22.

8. Stations. Engine Houses. Shops. Terminals

Twin Span Turntable Reduces Load on Center.* Ry. Age Aug. 26, '22.
Improvements to Moncton Yard and Engine Facilities.* S. B. Wass. Eng. Inst. Can. Sept., '22.

Factors Governing the Design of Passenger Terminals.* A. S. Baldwin. (Abstract read before Int. Ry. Congress in Rome.) Ry. Age Sept. 2, '22.

b. Special Railroads**9. Narrow Gauge. Light Railways**

Standardization of Mine Tracks. J. D. Martin. Engrs. Soc. W. Pa. Apr., '22.

f. Aeronautics**3. Aeroplanes**

The Helicopter and the Variable Pitch Propeller.* Mech. Eng. Sept., '22.

x. Miscellaneous

Les Nouveaux Hangars Métalliques pour Avions du Centre d'Aviation d'Orly (Seine).* (The New Metal Hangars for Airplanes at the Orly (Seine) Aviation Center.) F. Tayssier. Gen. Civ. Aug. 26, '22.

I. Municipal Water-Works. Agricultural Engineering. Irrigation**a. General Articles**

The Mechanical Equipment of Waterworks. George R. Collinson. Inst. Mun. & Co. Engrs. Aug. 29, '22.
Comprehensive Program for Denver Water-Works System. (From Report of Eng. Board of Review.) Eng. N. R. Aug. 31, '22.

b. Hydrology. Water Resources

The Hetch Hetchy Water Supply of San Francisco.* M. M. O'Shaughnessy. Am. W. W. Assoc. Sept., '22.
Engineering Geology of the Catskill Water Supply.* Charles P. Berkey and James F. Sanborn. Am. Soc. C. E. Sept., '22.

c. Dams and Reservoirs

The Sukkur Barrage.* Engr. Aug. 25, '22.
Experiments With Models of the Gilboa Dam and Spillway.* R. W. Gausmann and C. M. Madden. Am. Soc. C. E. Sept., '22.
Tentative Plan for the Construction of a 780-Foot Rock-Fill Dam, on the Colorado River, at Lee Ferry, Arizona.* Discussion. C. R. F. Coutlee, H. B. Mucklestone, Edwin H. Warner, F. A. Noetzli, Kirk Bryan, Arthur P. Davis, J. C. Stevens, J. H. Quinton, Ernest H. Baldwin, and C. S. Jarvis. Am. Soc. C. E. Sept., '22.
Closing 42 In. Outlet Pipes in Shoshone Dam Under 200 Feet of Water, with Wooden Balls. J. S. Longwell. (From *Reclamation Record*.) Eng. & Contr. Sept. 13, '22.
Plant and Program on the Hetch Hetchy Dam.* Eng. N. R. Sept. 21, '22.
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Barrages à Contreforts Triangulaires. (Dams with Triangular Buttresses.) G. Pigeaud. Gen. Civ. Aug. 5, '22.
Le Calcul des Barrages Arqués. (Calculation of Curved Dams.) Gen. Civ. Aug. 19, '22.
Beitrag zum Wasserschlossproblem.* (Contribution to the Water Reservoir Problem.) Stefan v. Flináy. Oest. Ing. Arch. Ver. Aug. 4, '22.
Durchbiegungen und Spannungen in Gewölbe-Staumauern.* (Deflections and Stresses in Arched Dam Masonry.) F. A. Noetzli. Schw. Bauz. Aug. 5, '22.

d. Analysis and Purification of Water

Prechlorination-Alum Treatment of Soft, Colored Waters.* Arthur L. Gammage. Eng. N. R. Sept. 7, '22.
Motorized Laboratory for Resort Sanitation Work.* W. C. Brockway and George C. Stucky. Eng. N. R. Sept. 14, '22.
Water Chlorination Control in Virginia.* Linn H. Enslow. Am. W. W. Assoc. Sept., '22.
Modern Practice in the Removal of Taste and Odor.* Norman J. Howard. Am. W. W. Assoc. Sept., '22.
Microorganisms in the Baltimore Water Supply.* John R. Baylis. Am. W. W. Assoc. Sept., '22.
The Sacramento Floating Type of Aerator Nozzle.* Harry N. Jenks. Eng. N. R. Sept. 7, '22.
Slow Sand Filtration Plant for Hartford, Conn.* Caleb Mills Saville. Eng. N. R. Sept. 7, '22.

e. Distribution of Water

Report of an Investigation of Condenser Performance in the St. Louis Water Department.* L. A. Day. Am. W. W. Assoc. Sept., '22.
Domestic Water Waste in England. G. R. Collinson. (Paper read before British Waterworks Assoc.) Eng. & Contr. Aug. '30, '22.
Fire Prevention and Fire Protection in Relation to the Public Water Supply. Frank C. Jordan. Am. W. W. Assoc. Sept., '22.
Cement-Lined Cast-Iron at Charleston, S. C.* J. E. Gibson. Eng. N. R. Sept. 7, '22.
Laying 30-in. Submerged Pipe for Norfolk Water-Works.* David A. Decker and John O. Miller. Eng. N. R. Sept. 7, '22.

x. Miscellaneous

The Improved Financial Condition of Water Works in the United States.* Leonard Metcalf. Am. W. W. Assoc. Sept., '22.

J. Sewerage, Sewage and Refuse Disposal**b. Sewage Disposal. Purification**

- Aeration Experiments at Bury. Joshua Bolton. (Paper read before Inst. of Mgrs. of Sewage Disposal.) Can. Engr. Aug. 22, '22.
 Refuse Disposal and Salvage Methods for Small Towns. J. W. Hipwood. (Paper read before Royal Sanitary Inst.) Can. Engr. Sept. 5, '22.
 Sewage Treatment. R. O. Wynne-Roberts. Can. Engr. Sept. 5, '22.
 Motorized Laboratory for Resort Sanitation Work.* W. C. Brockway and George C. Stucky. Eng. N. R. Sept. 14, '22.
 Underground Hygiene and Sanitation. R. R. Sayers. (From paper read before National Safety Council.) Engr. & Contr. Sept. 20, '22.
 Ueber die Reinigung und Beseitigung des Abwassers der Zechen des Gebietes der Linksniederrheinischen Entwässerungs-Genossenschaft.* (On the Purification and Removal of Waste Water from the Mines in the District of the Lower Left Rhine Drainage Company.) R. Weldert. Gesund. Ing. Aug. 4, '22.

K. Heat Engines**a. Steam Engines. Boilers**

- The Efficiency of Unaflo Engines.* A. D. Skinner. Power Aug. 29, '22.

c. Gas and Oil Engines

- Les Moteurs à Combustion Interne. Moteurs Marins à Deux Temps Diesel-Sulzer.* (Internal Combustion Engines. Diesel-Sulzer Two-Cycle Marine Engines.) C. Leverger. Gen. Civ. Aug. 19, '22.

L. Electricity**a. Production of Electricity**

- 2. Magneto and Dynamo. Electric Machines**
 Design of 45,000-Kv-a Generators, Queenston Plant.* R. A. McCarty and H. U. Hart. A. I. E. E. Sept., '22.

b. Distribution and Transmission of Electricity

- 1. Power Plants**
 Hydroelectric Power-Plant Design.* J. A. Sirnitz. Mech. Eng. Aug., '22.
 Gas Driven Power Plant Using Wood Fuel.* Engr. Aug. 25, '22.
 Power Plant of the First National Bank, Jersey City, New Jersey.* Power Aug. 29, '22.
 The Gennenvilliers Electric Power Station.* Engr. Serial beginning Sept. 8, '22.
 The Power Plant in a Modern Sugar Refinery.* Roger B. Stevens. Power Sept. 19, '22.
5. Transformers and Converters
 Les Installations Electriques de la Basse-Isère. Transformateurs et Interrupteurs de l'Usine de Beaumont-Monteux.* (Electric Installations of Basse-Isère. Transformers and Circuit Breakers at the Beaumont-Monteux Plant.) Gen. Civ. July 29, '22.

c. Electric Lighting

- 1. Arc, Incandescent, Mercury Vapor, Néon Lamps, etc.**
 Ornamental Street Lighting System at Lima, Ohio.* Elmer LeClain. Mun. & Co. Eng. Sept., '22.

d. Mechanical Uses of Electricity

- x. Miscellaneous**
 Fortschritte in der Elektrisierung der Landwirtschaft.* (Progress in the Electrification of Agriculture.) Harald Wallem. Oest. Ing. Arch. Ver. Aug. 18, '22.

e. Electro-chemistry and Electrometallurgy

- Staubabscheidung aus Gasen durch Elektrizität.* (Separation of Dust from Gases by Electricity.) Joh. Körting. Ver. deu. Ing. July 22, '22.

M. Architecture**a. Educational, Government and Scientific Buildings**

- Mitteldeutsche Ausstellung in Magdeburg.* (Central German Exposition at Magdeburg.) Peters. Z. d. Bauver. Aug. 12, '22.
 Der Neubau des Landesfinanzamts (früher preussische Oberzolldirektion) in Stettin.* (The New Building of the National Finance Board (formerly the Prussian General Customs Commission) at Stettin.) Z. d. Bauver. Aug. 19, '22.

b. Business and Commercial Buildings

- Constructing Modern Office Buildings in Japan.* Eng. N. R. Sept. 21, '22.

d. Storage Buildings

Five Million Foot Gas Holder, Hamilton, Ontario.* H. E. Gingrich. Can. Engr. Aug. 22, '22.
Concrete Grain Elevator Rebuilt at Chicago.* Eng. N. R. Sept. 21, '22.

f. Factories and Mill Buildings

The Kelham Beet Sugar Factory.* Engr. Aug. 18, '22.
Die Bauanlagen für die Herstellung der Salpetersäurefabrik in Muldenstein.* (The Building
Plans for the Erection of the Nitric Acid Factory at Muldenstein. Karl Mentzel. Zeit.
Bau. Pt. 7, '22.

g. Other Buildings

Engineering Features of Chicago's New Gas Plant.* J. I. Thompson. West Soc. Engrs.
Sept. '22.

h. Roofs. Domes

Long-Span Concrete Roof Arches for Chicago Garage.* Cem. Eng. Aug. '22.

i. Fire Protection

Recent Fire Tests of Loaded Timber Columns. Theodore F. Laist. (Paper read before
Building Officials Conference, Ind.) Eng. & Contr. Aug. 23, '22.
Fire Prevention and Fire Protection in Relation to the Public Water Supply. Frank C.
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